



FRIDAY, AUGUST 30.

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Contributions.

Starting a Locomotive by an Auxiliary Engine.

KNOXVILLE, TENN., Aug. 24, 1889.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I notice in your issue of the 16th an exception taken by Mr. W. F. Dixon to Mr. Booth's plan of starting a locomotive with an auxiliary engine. In my judgment the plan is practicable, and I do not consider it necessary to have the auxiliary of equal power to the engine. The question how the power should be applied is the one to be considered, as there are many devices, such as multiple, triple or quadruple gearing or by friction, that would move a locomotive over its centres very easily, even after all slack had been taken up in the train. The question of improving the counter balancing by this system, however, is, I think, doubtful, for with the small centres as commonly used in all consolidation and heavy draught engines would there be room to get the required weight? In the present mode of balancing one side assists the other.

SUBSCRIBER.

Fair Treatment of Damage Claimants.

TO THE EDITOR OF THE RAILROAD GAZETTE:

I have read your comment on the claim rules of the Southern R. & S. Association with much interest. I see you bear down on the idea that original bills of lading and expense bills should be surrendered on presentation of claim and kept on payment of claim. If I understand you, you think that an endorsement of the fact of such payment on the claimant's papers should be enough, and that thereupon these papers should be handed over to him. What will you say when I tell you that no less a railroad than the Pennsylvania, which (I was going to say) shall be nameless, will not give back a claimant's papers even when claims are refused? If papers belong to the consignee, even in cases of payment, by what rule of law or equity is he deprived of them when payment is declined? Perhaps, Mr. Editor, you can throw some light on this question, which has considerably puzzled some of us.

MERCHANT.

[As a Wolf was lapping at the head of a running brook, he spied a stray Lamb paddling, at some distance, down the stream. Having made up his mind to seize her, he bethought himself how he might justify his violence. "Villain!" said he, running up to her. "how dare you muddle the water that I am drinking." "Indeed," said the Lamb humbly. "I do not see how I can disturb the water, since it runs from you to me, not from me to you." "Be that as it may," replied the Wolf, "it was but a year ago that you called me many ill names." "Oh, sir!" said the Lamb, trembling. "a year ago I was not born." "Well," replied the Wolf, "if it was not you, it was your father, and that is all the same; but it is no use trying to argue me out of my supper"—and without another word he fell upon the poor helpless Lamb and tore her to pieces.—ÆSOP. 550 B. C.]

Railroad Managers and the Commission.

TO THE EDITOR OF THE RAILROAD GAZETTE:

Some of us who are more or less responsible for the management of our several departments of railroad transportation have been a little disturbed of late by the telegraphic reports of the "conferences" (if such they can be called) between the managers of the St. Paul-Chicago lines and the Hon. Thomas M. Cooley, Chairman of the Inter-state Commerce Commission. As long ago as the famous Louisville & Nashville decision the Commission took the ground that the only way this vast and complicated subject of transportation could be treated was to let each railroad interpret the Inter-state law for itself, and then upon complaint the Commission would examine into all the facts and decide judicially whether such interpretation was lawful. This was clearly right; and, reading between the lines, one could easily see that no railroad officer would be punished for any act done in good faith before the issuance of a decision of the Commission declaring said act illegal. This put every railroad manager

in the same position before the court as is occupied by every citizen—to be considered innocent till he is proved guilty. It has always seemed to me that, as a body, we have failed to act up to this standard. I, for one, am opposed to the constant truckling to the unofficial utterances of any one member of the Commission, which has been so conspicuous a feature of the railroad news for a year. We railroad men occupy before the Commission and before the country a far stronger position than we seem heretofore to have assumed, and when the chairman of the Commission says bluntly that our Chicago brethren are acting "like a parcel of fools," it is time to examine the grounds upon which Judge Cooley has a right to promulgate such an opinion.

The Act to Regulate Commerce is supposed to be directed against the railroads, and so it is, as regards certain alleged abuses; but railroad men who have not read it carefully will be surprised to find how Congress has hedged the subject about with precautions. That "due process of law," of which our great Constitution makes so much, has not been forgotten. Section 10, as amended, says: "That any common carrier who shall do or omit to do [any act declared prohibited or compulsory] shall be deemed guilty of a misdemeanor, and shall, upon conviction thereof in any district court of the United States, be subject to fine." So that as to the stringent provisions of the Act outside of the Commission's control, regular conviction must be had before punishment. Some of us still have the idea that the Commission does the punishing. Again, Section 14 says: "That whenever an investigation shall be made by said Commission, it shall be its duty to make a report in writing, and such findings in all judicial proceedings shall be deemed *prima facie* evidence." Every decision made formally by all the commissioners is subject to review; witness the Kentucky & Indiana Bridge case, when the courts overturned the decision of the Commission and upheld the dissenting opinion of Judge Schoonmaker. This fact is explicitly stated in Section 16, "That whenever any common carrier shall violate, etc. * * * the Circuit Court of the United States sitting in equity shall have power to hear and determine the matter * * * in such a manner as to do justice in the premises." It was obviously the intention of Congress to give to the judicial findings of the Commission just such weight as their merits demanded and no more.

But all this has reference to the formal opinions of the Commission as a body when expressed in writing and officially. Section 17 reads as follows: "A majority of the Commission shall constitute a quorum for the transaction of business." This majority has not been and cannot be less than three. Here again we see the desire of Congress for fair play towards us. The honored chairman of the Commission is by right of his position the most influential single member of that body, but how far he represents the sentiments of the majority is an open question. Commissioners Morrison, Bragg and Schoonmaker are men of character and standing; it would be no compliment to them to say that they had granted to Judge Cooley the power to speak on all occasions for them without consultation; and without this consultation the opinion of any one commissioner is an individual opinion only. I will give one illustration of what I mean. Judge Cooley is reported as promulgating as the opinion of the Commission, in the Northwest rate complication, that a 15-cent rate between Chicago and St. Paul on seaboard business is illegal because it is not a joint rate, and that to be legal all parties must agree on a through rate. Now the *Railroad Gazette* has cited the case of the Milwaukee Chamber of Commerce, in which Commissioner Bragg, speaking for the board, declared legitimate this very kind of rate which Chairman Cooley denounces. Do you believe that Mr. Cooley now declares the real judicial opinion of a majority of that body? I doubt it very seriously. I have no particular sympathy with the Chicago, Burlington & Northern, but I must say that were I Mr. Hamblin, or any other northwestern railroad man, I would stand my ground, relying upon the sense of fair play in the people, in the reality of my need for meeting Canadian and Lake competition, and last, but not least, in the justice of the majority of the Inter-state Commerce Commissioners. You will see that the expression "a parcel of fools," as coming from a gentleman occupying so high and judicial a position as Judge Cooley, sticks in my throat. The Commission is only strong as it speaks out honestly for the right, and represents truly the will of the people as to that right. In company with other railroad men and citizens, would regret to see the Commission's influence foolishly frittered away by unjudicial and injudicious remarks and opinions. The present mail brings me a California paper in which Chairman Cooley is quoted as saying to a reporter: "We cannot prevent American lines from lowering their rates; but will see that they do not raise them." My conclusion is therefore the same with which I started, that railroad men are too subservient to unofficial opinions. Leaving out of view the mandatory clauses of the Inter-state act, and confining my meaning to the application of principles to everyday tariffs, I think, with Davy Crockett, that if we are sure we are right we ought to go ahead, at least until a full, fair discussion and judicial decision by a majority of the Commission, clearly backed by public opinion, shall decide that we are wrong. If we form our opinions honestly and carefully, we ought not to be so afraid of them.

TRAFFIC DEPARTMENT.

Consumption of Coal as Affected by Enginemen.

TO THE EDITOR OF THE RAILROAD GAZETTE:

CAMDEN, N. J., Aug. 13, 1889.

The article in the *Railroad Gazette* of Aug. 2 by Mr. Geo. H. Baker, entitled "Consumption of Coal as Affected by

Enginemen," is on a subject in which I am quite interested, having had a somewhat extended experience as a locomotive runner. While I heartily indorse and emphasize much that Mr. Baker says as to the amount of fuel wasted by careless or incompetent engineers and firemen, I am not prepared to accept all his conclusions as entirely correct, some of them, I think, having been arrived at by improper reasoning. He will, therefore, pardon me if, in a review of his timely article, I point out to him some mistakes that, in my opinion, he has made. I will not give very much attention to firemen at this time, but will say that it is absolutely impossible for an engineman, no matter how skillful he may be, to run his engine economically unless he can have the co-operation of a competent fireman; while, on the other hand, good firing must always be supplemented by good running to insure economical results.

Mr. Baker says: "Care for the safety of his engine and train is, of course, an engineer's first duty, and one to which he is held most strictly. The next requirement is successful running—pulling his train over the road promptly. . . . At present upon most railroads engineers who satisfactorily meet these two requirements and take proper care of their engines fill the bill. But . . . competition is narrowing the margin of earnings until the strictest economy in operating is demanded, and when it is understood to what extent engineers can influence the operating expenses of the engine in their charge they will be held to strict account for the economical operating."

Now my observation is that the engineer who takes good care of his engine, keeps his train up to time, climbs the hills and gets over the dangerous parts of the road most successfully is usually one who does not use much more fuel than is necessary to do the required amount of work in a given time, and it would be anomalous for an engineer to use good judgment in all other respects except consumption of coal and fail to do so in that. On the other hand, it is the engineman who lacks good judgment, and is often getting his train and himself into difficulties, who has the ability to empty the coal bunker the soonest.

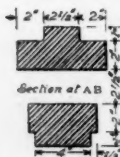
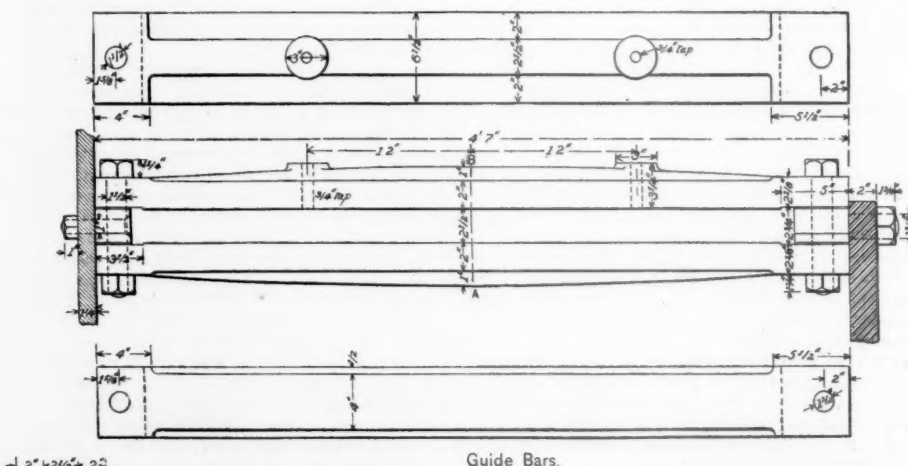
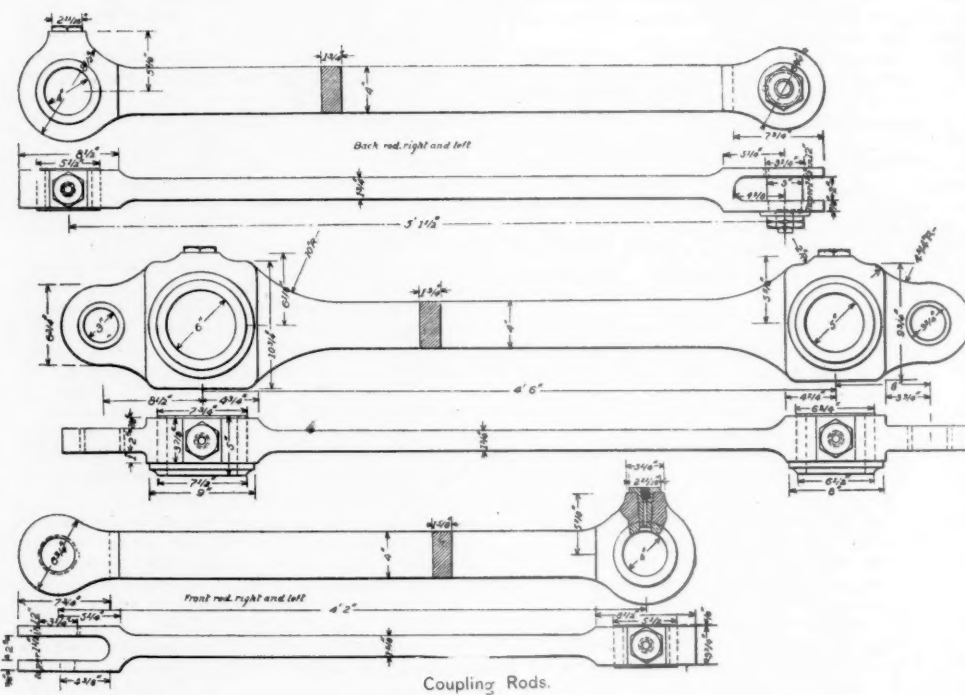
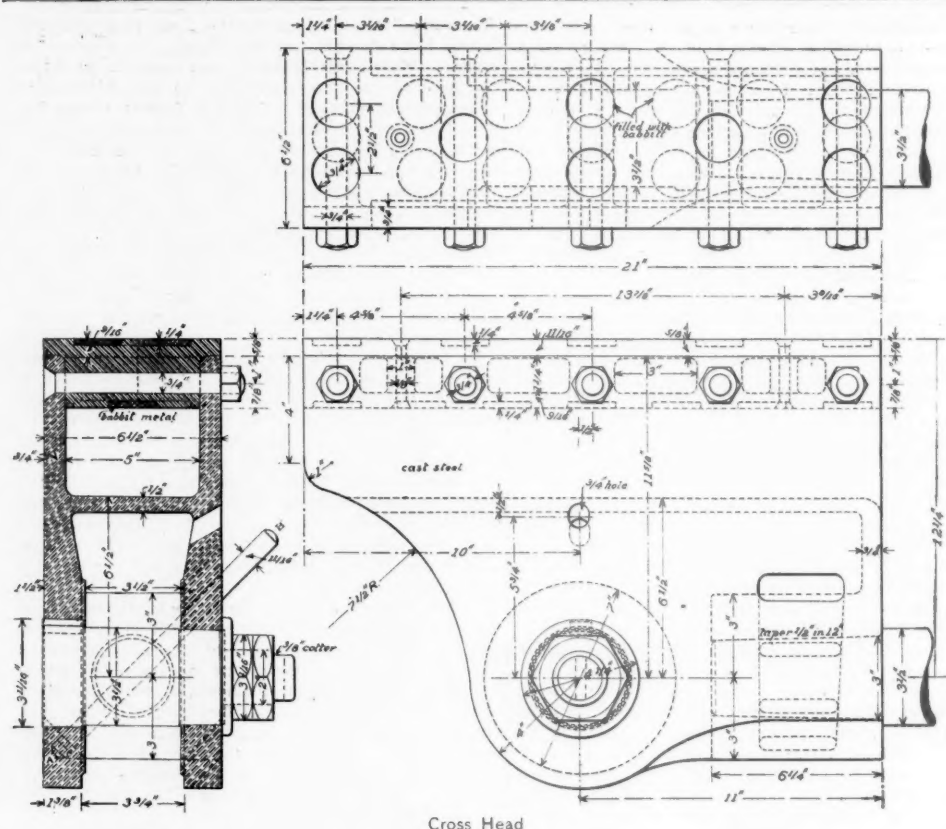
As to a full throttle and short cut-off, good results can be obtained in no other way if the train be heavy and fast; but if the train is light and the engine does not have to be worked anywhere near to her capacity, it is not always practicable to attempt to save steam by cutting it off very close. This is because in practice an engine will work well with the lever back only to a certain point, due to the fact that an extremely early cut off gives too much back pressure so far as the pressure is due to the action of the valve.

As Mr. Baker says, supplying the boiler with water plays a very important part in the economical management of a locomotive. I will not discuss the necessity for a boiler to be full of water at starting time, as that fact is so generally recognized that an engineer who habitually fails in that respect should be relegated to a shifter or a gravel train engine for the remainder of his life. But the necessity of a boiler full of water to start with is not, as he thinks, to create an additional supply of heat that can be drawn upon for the extra amount of work required to get the train under headway, but because it is often necessary to run a train a mile or two on the start with the injector shut off, in order to give the fire time to get in condition to generate steam as fast as the engine will need it, and then, while the water is still well up in the boiler, the injector can be set to working and kept at it almost uninterruptedly, although the engine's work at places on the road may be very heavy.

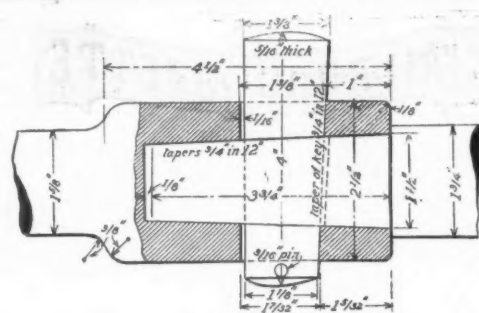
Another mistake that Mr. Baker falls into is the assumption that every engine that blows off steam must of necessity be consuming a certain amount of fuel with no compensating results. He criticises the crew of an engine which was waiting at a divisional point for wasting steam in this way. They were probably only doing what every competent engineman and fireman knows must be done before starting on a hard run, and that is, get the coal thoroughly heated; and even then, as I have already said, they probably had to run a mile or two before their fire was in proper condition to make steam rapidly. Sometimes, just previous to starting, if the fire is warmed up with the blower for a few seconds only, it will be sufficient, while at other times the blower will have to be worked for several minutes, though the engine may be blowing off all the while.

As to the popping of the safety valves while out on the road, of the engines that were running his train, I have no doubt but that a part of it was unavoidable, for the reason that when the steam on an express engine is being carried up to the maximum, the valve will often pop the instant the throttle is shut off, and, in case it is an anthracite engine, will frequently continue to blow for some time afterward, even though the injector be throwing water at its full capacity. While I have endeavored to show that, to a certain extent, blowing off of locomotives cannot be avoided, I admit that there are many enginemen who waste large quantities of fuel every year by the improper handling of their injectors. If they run free-steaming engines they allow them to blow off excessively. If their engines are not good steamers they make them worse still by the manner in which they supply them with water. Enginemen who are so careless as to allow their engines when hauling trains to blow off freely for some time before putting the injector to work, and then, after it is started, to never ease it off until the steam has dropped 20 or 25 lbs., are not nearly so few as some may suppose.

A few years ago, when the heating capacity of locomotives in proportion to the size of their cylinders was not so great as at present, an anthracite engine was being run on an exceptionally fast express train on a prominent road. As the question of making the time was almost wholly involved in that of carrying a full pressure of steam, the crew natu-



DETAILS OF CONSOLIDATION LOCOMOTIVE, CLASS E-6.
BALTIMORE & OHIO RAILROAD.



Detail of Valve Stem.

rally resorted to every means in their power to get the steam. The fireman of that engine once made the remark that he thought his engineer could "come a little nearer to getting water into the boiler of a locomotive without her knowing it" than anybody he ever saw. Now, in that case the study of the engineer was how to keep the water in the boiler with the least reduction of steam. Had he been running a train for which his engine could have made a surplus of steam, his aim, no doubt, would have been to have her make just enough for the requirements, and no more, and so save his fuel. Local trains afford better opportunities for wasting fuel than through trains, and I have no doubt whatever that a free-steaming, anthracite engine working on a local passenger train of 120 or 130 miles run in a day, if not carefully watched by both engineman and fireman, will consume several hundred gallons of water more than is necessary.

Probably the most interesting part of Mr. Baker's communication is that in which he gives the record of some practical tests in fuel consumption. If these tests were entirely fair in all respects they certainly show some remarkable results, and, in fact, so much so, that I am inclined to doubt the accuracy of the figures given. Let us take the first, for example, that of July, 1886, which shows a difference very much less than the average difference. Here are 13 engines running for a month; 12 of them run 25 miles each with a ton of coal, the other one runs 35 miles. Now if this test had shown just the opposite result, it would have looked all right, or in other words, if one, two or even three of those enginemen had run but 25 miles per ton of coal, while the others ran 35, it would have been reasonable. There would be some satisfaction in knowing more of the facts in connection with these various trials in fuel consumption. Did all of those enginemen know that a record of their performance was being kept, or did only "H." know it, or did none of them know it? Were the engines all well matched in respect to their consumption of coal, provided they had all been equally well handled? Every engineman knows that engines of the same class and in the same general condition and handled by the same men often show a great difference in the amount consumed.

In the last test mentioned, August, 1888, the performance of engine B is put against that of three other engines, and one of the three is specially selected for the comparison because she was equipped with an extension front, open stack, etc. This might lead us to suppose that Mr. Baker considers extension fronts conducive to economy in fuel. If so, I would be glad to learn his views on that subject. As a matter of fact, are there any merits claimed for the extension fronts in addition to their being excellent spark arresters?

Reverting to that engine again that blew off continuously for five minutes, how was he able to figure out without knowing the area of the safety valve or the pressure of steam that she wasted 447 lbs. of water in that time, and where does he get his authority for saying that 75 lbs. of coal are required to evaporate that much water from the boiler of a locomotive while she is standing?

T.

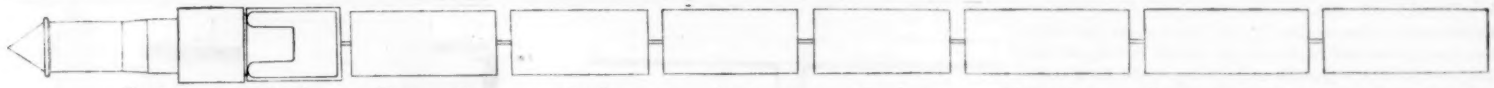
Details of 20-in. by 26-in. Consolidation Locomotive, Baltimore & Ohio Railroad.

In the *Railroad Gazette* of Aug. 2 was given a description and general elevation of the 20 by 26-in. consolidation type of locomotive, class E-6, of the Baltimore & Ohio. In this issue are illustrated certain of the details.

The crossheads are made of cast steel, babbitt on all wearing surfaces. The guides are made of cast iron. The crosshead is of a shape generally used with the Laird guides, differing mostly in the dimensions. The horizontal web just above the wrist pin is seldom seen. It is hardly necessary, but there are several advantages resulting from its use; the gritty oil from the guides cannot reach the wrist-pin and cause heating or excessive wear, as in the more common forms. The centre of the wings of the crosshead is stiffened by its use, and during process of annealing the cast-steel heads the wings are kept in their proper position by such a web. This last is a decided advantage, and to overcome the difficulty with crossheads constructed without this web, small connecting ribs from side to side of the head are cast, and broken out after the process of annealing is completed.

It is difficult to see how an engineer can properly oil a wrist pin through such a small hole as the one here shown. It is customary to make this oil hole at least 1 1/4 in. in diameter.

The guides are peculiar in having only one bolt at the back and front ends to hold them to the cylinder blocks. The front end fastening is superior to that at the rear end. The valve



Engine.	Tender.	Baggage Car.	Coach.	Coach.	Coach.	Dining Car.	Drawing-room Car.	Drawing-room Car.
Trucks.....	Four-wheel.	Four-wheel.	Four-wheel.	Four-wheel.	Four-wheel.	Six-wheel.	Six-wheel.	Six-wheel.
Weights, lbs.....	73,000	50,990	51,000	51,320	51,090	67,934	81,010	80,640
Actual Braking Power, lbs.....	25,000	45,000	45,000	45,000	45,000	45,000	45,000	45,000
Possible Braking Power, lbs.....	25,000	45,000	45,000	45,000	45,000	61,000	72,000	72,000

ACTUAL AND POSSIBLE BRAKING POWER ON A PASSENGER TRAIN.

rod joint is made taper, and is the most satisfactory of all forms of connections used on valve rods. The minor features of these details are too plainly indicated on the drawings to require further mention.

The coupling rods are made of hammered iron, forged solid in one piece. The illustration so clearly shows the methods of attaching the various parts that description is unnecessary. However, attention may be called to the peculiar shape of the stub ends. The long radius between the body of the rod and the stub end is a detail worth the attention of those constructors who use but a $1\frac{1}{2}$ in. to 2 in. radius at this point.

Actual and Possible Braking Power.

The diagram, which is here given of the actual and possible braking power of a passenger train, is the result of an investigation into the causes of an accident which took place not long ago, because the brakes, in an emergency stop, could not arrest the train before a collision took place. The weight of the engine and that of each vehicle was ascertained, as well as the proportions of the levers of the brake gear. Then, assuming that the pressure in the auxiliary reservoirs was 70 lbs., the quantities in the two lines "actual braking power" and "possible braking power" were calculated. Below are given in tabular form the weights of the vehicles and the percentages of those weights which were available for braking, and which might have been available. It will be seen at a glance that if the engine had been equipped with driver brakes, and if all the wheels of the six-wheeled trucks had been braked the braking power available would have been increased from 57 per cent. of the train weight to 77 per cent. or about 35 per cent.

The weights of the vehicles of each class, and the percentages of the total train weight are shown in the following table:

	Weight. Lbs.	Per cent. of total weight.
Engine.....	91,000	15.2
Tender.....	73,000	12.2
One baggage car and three coaches.....	204,400	34.2
Two drawing room and one dining car.....	229,584	38.4
Weight of train.....	597,984	100

In the following table are shown the braking power on each class of vehicles, and the percentages of the total train weight, as the conditions actually were:

	Brake power. Lbs.	Per cent. total train weight.
Engine.....	60,000	9.0
Tender.....	25,000	4.0
1 baggage car and 3 coaches.....	180,000	30.1
2 drawing room and 1 dining car.....	135,000	22.6
Total.....	340,000	56.9

In the following table are shown the brake power of each class, and the percentages as above, supposing the locomotive to have had driver brakes and the six-wheeled trucks to have had all the wheels braked:

	Brake power. Lbs.	Per cent. total train weight.
Engine.....	50,000	8.4
Tender.....	25,000	4.2
1 baggage car and 3 coaches.....	180,000	30.1
2 drawing-room and 1 dining car.....	205,000	34.3
Totals.....	460,000	77.0

Equalizing Lever Applied to Railroad Switches.

This equalizer, fig. 1, was designed to remedy a defect in the connections for working a cross-over, or more than one switch, by one lever, as double slips, etc. The difficulty has been that it was almost impossible to adjust and keep adjusted the connections and stroke, so as to make both switches work equally well up to the stock rail. This is caused, as shown in dotted lines fig. 2, by one switch checking the complete action of the other. By the use of an equalizer equal pressure is exerted on both switches, and it is made impossible for one switch to check the other.

Fig. 2 shows one way of connecting the equalizer in the case of a cross-over road. Fig. 1 is a detail elevation of the equalizer and adjacent connections.

This device has been used by the Johnson Railroad Signal Co. for twelve months, and has given excellent results.

A Trip with the Flying Scotchman.

On Aug. 10, while visiting Mr. Worsdell at Gateshead, it was the writer's fortune to receive an invitation to ride on the locomotive hauling the fastest train in Great Britain. This is the Flying Scotchman, which leaves Newcastle at 3:39 p. m. and reaches Edinburgh at 6:20, 2 hours and 41 minutes, with one stop. The distance is 124 $\frac{1}{2}$ miles, and the speed, including the stop, is therefore 46.4 miles per hour. Such an opportunity to see the working of a fast compound locomotive is not often obtained. It was 3:45 p. m. before the signal was received to depart, and the start was, therefore, made 6 minutes behind time.

Standing in the station the train looks rather formidable, the 10 coaches are crowded and the passengers discussing

priority of claims to the desirable seats. The luggage vans are filled to the roof. The locomotive, painted a pretty green color, rather towers above the cars. It is a fine looking piece of machinery, with only one pair of driving wheels, to which sand is fed by a steam jet of the Gresham & Craven pattern. The cylinders are compounded—that is, one is used at high pressure and the other at low pressure. The finish of the locomotive is of the best, and harmonizes well with the general outfit of one of the fastest trains in the world. The dome casing is so thin and well formed that, as it gradually expands at the base and blends with the jacket of the boiler, the joint between the two is almost imperceptible. The smoke stack and safety valve casing accords in style with the dome casing, and these harmonize with the shape of the cab roof and the remaining exterior trimming; thus the whole contour and color of the locomotive being arranged in good artistic taste, great power and speed are suggested. As the eye reaches the large wheel covers that surround the 7 ft. 6 in. drivers, the suggestion of high speed is considerably increased.

When the signal to depart reaches the engineer he at once starts the steam sand jet by moving the handle of a small valve, not unlike a Westinghouse engineer's air-brake valve in appearance. This movement causes a small jet of sand to be blown between the driver and the rail. Then a small button is pulled, which is attached to a rod leading from the cab sheet directly in front of the engineer to a small valve at the smoke box, which admits high-pressure steam into the low-pressure cylinder. The throttle is now opened and at once the wheels grind on the sand, the train commences to move. As soon as the high-pressure exhaust has reached the same amount as that in the low-pressure cylinder, or nearly that amount, the button on the steam-valve handle moves forward automatically and direct steam is shut off from the large cylinder and the engine is working compound. In getting under way the train accelerates rapidly, but at no time is the throttle fully opened. The cylinder power is great enough to slip the wheels at all times, even when the sand is applied to the rails.

There are a few grades on the line and these are not heavy ones. The track is quite crooked, and in two places makes a turn of nearly a semi-circle. When the locomotive, at a speed of 50 miles per hour, strikes these places, the lateral shock in the cab is considerable. On one of these curves, before the track was reduced in curvature, a locomotive drawing the Scotch express was overturned. The driver was buried for three hours under his engine in a hole made by the steam and water escaping from the boiler. He was not seriously injured, and except a few marks upon his face is as sound as ever. It was with him that the writer rode on Aug. 10. The fireman is an old hand, and manages the fire easily as he smokes and calls attention to the old castles, the sea, rocks and other interesting objects along the line. The comfort of the enginemen is well cared for on these engines. On each side is a comfortable wooden seat, but without cushions. Good tight clothes boxes are provided, and all of the finished parts are of forms that are easily cleaned. As the enginemen sits in his seat on the right hand side of the locomotive he can reach all of the handles which it is necessary for him to operate, with but little movement of the body. While running, however, he seldom sits down, but keeps his eyes ever on the alert for the signals of the "block system" with which the road is equipped. It occurs to the observer that one of the great advantages of the block system, where the signal are close to each other, is that the engineer is thereby compelled to be over watchful from the window, fearing he may pass one set against him and thereby be subjected to a penalty.

The boilers of locomotives on English railways are seldom provided with gauge cocks, and these locomotives are no exception. Two water glasses are used to determine the water in the boiler, one being placed upon each side. Automatic cylinder oilers are not in general use, and, instead, the well-known "tallow cup" is mounted upon each side of the cab. The cab is made of steel sheets upon an iron frame, surmounted with a modern roof, which extends well over the whole foot-plate and effectually protects both the engineer and fireman from the weather. The front windows are circular and have brass frames hinged to the front of the cab. In order to provide good ventilation there is a series of $\frac{1}{4}$ -in.

holes punched in the cab front sheet, close up under the roof. The steam gauge is small, about half the dimensions of those used in the United States. During this run the hand of the gauge varied but little from 180 lbs. per square inch, which is the pressure used on the compound locomotives. To maintain this pressure the fireman seemed to do but little manual labor; however, it may have been the result of some mental exertion. Smoke at times appeared in small quantities at the top of the stack, but during most of the run the jet of vapor issuing from the smoke-box was almost entirely white. The reason for the absence of smoke while soft coal was being used, in this case, was undoubtedly largely the use of a well-arranged brick arch in the fire-box, a fire-door air supply deflector, and a proper admission of air above the fire through the fire-door hole. The fire door is of simple form, and has a sheet-iron shield to protect the eyes of the engineer and another to protect his legs. The fireman uses a shovel with a long blade about 22 in. \times 8 in., and with this, and a bent poker to reach under the fire-brick arch, he succeeds in supplying coal evenly to the fire, and keeps it clean and burning freely. During the run he keeps down the coal dust and cleans the deck by the use of a brush dipped in a bucket of water. A sheet-iron apron covers the joint between the engine and tender, as is the case with the American locomotive. The valve motion used is the Joy. The cylinders are 20 in. \times 24 in. and 28 in. \times 24 in., and the weight upon the two drivers is about 36,000 to 38,000 lbs.

These locomotives make the run from York to Newcastle, 81 miles, in 80 minutes, with a total train-load, including the engine and tender, of 215 tons. On one occasion 5 miles were run in 3 $\frac{1}{2}$ minutes. The capacity of the tender is 3,200 gallons, of which 2,900 gallons are used in the run of 124 $\frac{1}{2}$ miles; the coal used is 26 lbs. per mile average. At the Gateshead shops Mr. Worsdell is building several locomotives of the same general pattern, with 7 ft. 7 $\frac{1}{2}$ in. drivers, to carry 200 lbs. boiler pressure. The cylinders are 20 in. \times 24 in. and 28 \times 24 in.

So much, then, for the general character of the locomotive and its operators. The line over which the machine is moving deserves attention. It is not hilly, but it is crooked; it does not seem possible, as one views it from the cab, that it could be the same upon which the runs of last season were made. It was then that a speed of 81 miles per hour was attained. This season the races, which were anticipated and prepared for by the Northeastern, have not taken place, and therefore the average speed is slower than in 1888. The officers of the line state that during the fast runs there was but little if any more fuel used between terminals than when running at a slower speed. This statement is indeed a "hard nut to crack" for those who have been writing during the past year of the enormous resistance of the air at high speed, and the stupendous wave of deflection which precedes the train, and causes it to be ever climbing up hill. But facts are facts, and these writers will have to find a new wave or a new roadbed theory to offset the wave theory, mitigate its evils, and cause the facts to agree with the hypothesis. But let the resistance be what it may, the train moves easily at 65 to 70 miles an hour with but little visible effort on the part of the locomotive. Apparently there is no reason why the speed could not be made 80 miles per hour as well as 70. The engineer, by long experience, is familiar with the line, and only at the one stop between Newcastle and Edinburgh was the air brake used. If it was necessary to slow the train at any point, the engineer was aware of it beforehand, and shut off steam and allowed the train to gradually slacken pace. This, of course, takes more time than to slow the train by means of brakes, but in this case to save time is

TO SECOND SWITCH.

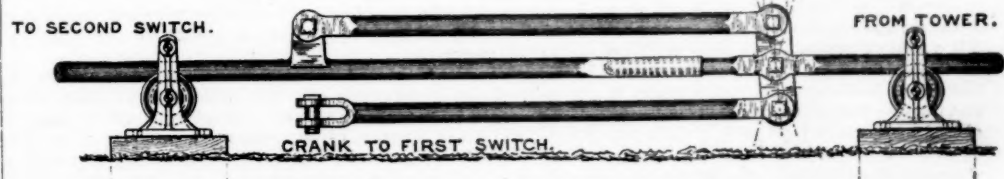


Fig. 1

JOHNSON'S EQUALIZER FOR SWITCH CONNECTIONS.

Fig. 2.

unnecessary. The roadbed of the Northeastern has broken stone and gravel ballast, but on the North British, which is the line used from Hawick to Edinburgh, the ballast is of large-sized broken stone. The difference in the riding of the locomotive is quite perceptible on these lines. On the Northeastern the softer roadbed and the presence of wooden blocks between the rails, and the cast-iron chairs upon which the rails are carried, reduce the shocks to the locomotive and carriages, while upon the North British the rigid roadbed and rail chairs cause the location of the rail joint to be plainly marked by a series of sudden shocks. At high speeds these shocks cause one to think the locomotive is pounding badly. In fact, the condition of the rail joint on all European roads is uncomplimentary to the engineering talent, and while the joints may not be in worse condition than those in the United States, yet the use of carriages without bogie trucks results in the transmission of the shocks directly to the car body, and therefore it is far less comfortable to read in a European than in a United States railroad carriage, and to write therein when the train is in motion is impossible. Sometimes the cars are not held steady by the spring buffers, and then they proceed with a sort of snake-like motion that is disagreeable in the extreme. This, however, is seldom noticed, because the majority of the rolling stock is kept in good repair.

On these Scotch expresses all weight is reduced to a minimum, and each car is filled before another is added. As one looks into the window of a compartment holding ten persons, five on each seat, with all their hand luggage and wraps, he cannot avoid a comparison with the New York and Chicago "Limited," with its capacious accommodations for each passenger.

Passengers on the lines in the north of Great Britain are locked in the carriages after they enter, and when the Scotch express stops at the one place in its run, great is the howl of the traveler to be liberated, in order that he may get the sweetbread and drink of whiskey—all served from the same counter—before the train starts. Last year the whole run of 124½ miles was made without a stop, and the carriages are unprovided with toilet conveniences. In the south of England and in France and Germany the doors of the compartments are no longer locked, but can be opened from the window by the passengers.

From Newcastle to Hawick, the first and only stop, the train gains three minutes easily, and its operation is most satisfactory; the boiler and grate are small, and the pulsations of the exhaust—only one-half as many as in the case of the single expansion engine—are but just perceptible. The fire burns brightly; there is but little smoke, in fact none that could in the least inconvenience the passengers in the cars. The locomotives ride so easily that a seat on a smooth board is comfortable at a speed of 65 miles per hour, and the writer's companion, Mr. William Forsyth, Mechanical Engineer of the "Burlington," seemed to be very well pleased with a stool made up of a towel and a water bucket on the fireman's seat. Dust, there is none, and if one puts his head out of the cab-window nothing but air rushing past is perceptible.

The counterbalancing is almost perfect, as far as the motion of the locomotive itself is concerned. A careful watch of its motions resulted in a discovery of none that could be attributed to a lack of or a superabundance of balance weights.

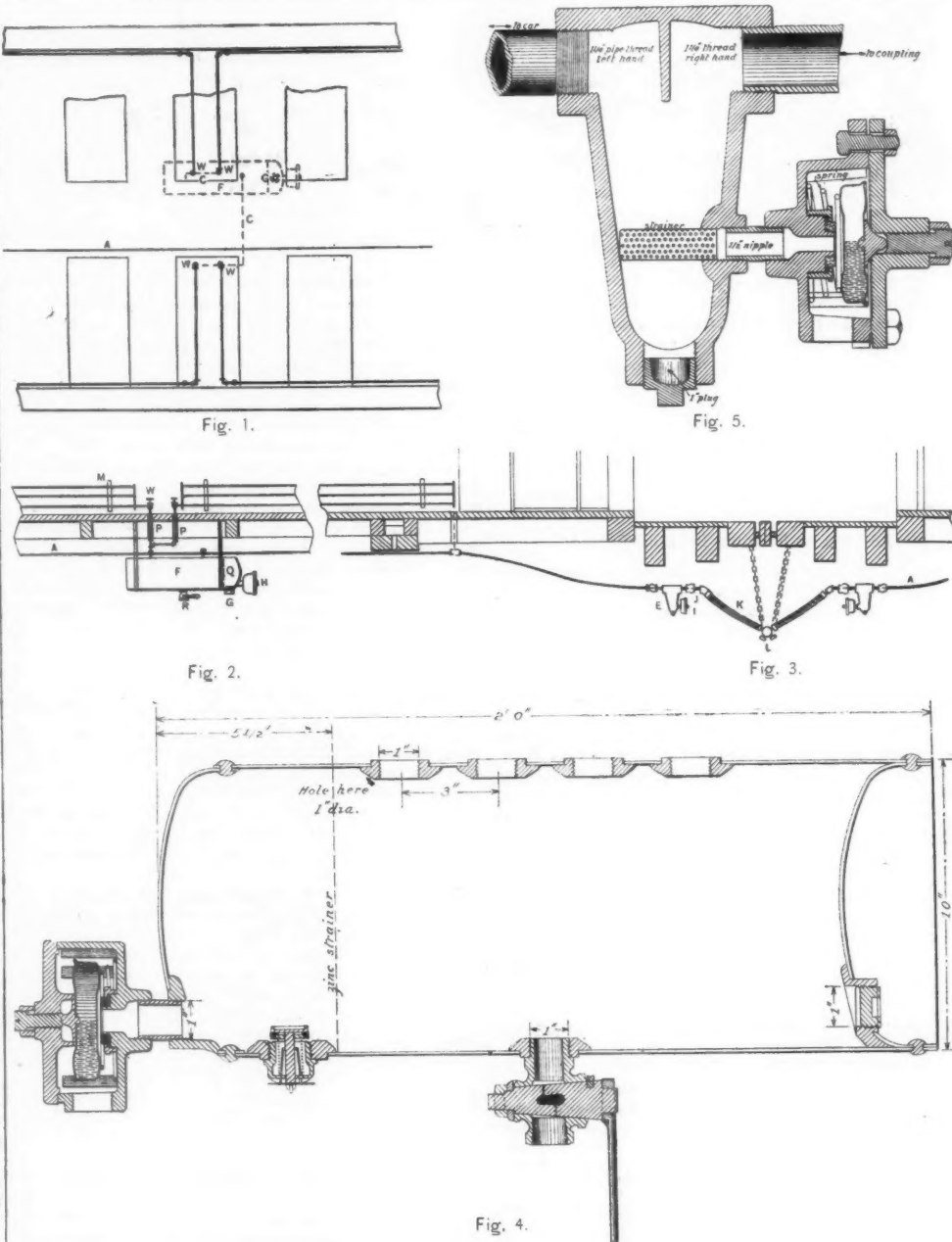
The whole trip was so well managed that when arriving in Edinburgh at exactly 6:20, having been running almost continually with the same engine for 2 hours and 35 minutes at an average speed of about 50 miles per hour, the locomotive was in good condition to make the return trip, which she did in a short time thereafter. Much of this success is due to the great attention paid to the details of the locomotive. Each part is carefully arranged so that it can be oiled and cared for while running, and pipes lead from the axle boxes to the foot plate inside of the cab, within easy reach of the fireman's oil cup. This locomotive ride is probably the most instructive of all taken by the writer this summer, not excepting that in Germany on the compound locomotive of the state railroads.

D. L. B.

Gold's Plain Pipe System of Car Heating.

The illustrations given herewith show a system of continuous car heating devised by the Gold Car Heating Co., of New York City, which does without the water cylinder in the cars.

The only difference between this system and the Gold storage system is that, in place of a single line of pipe with large water cylinders for storing heat, three lines of plain 1½-in. pipe are used, their position being one above another, as in ordinary piping when attached to walls. The arrangement is such that at any future time the radiators can be changed for storage heaters by simply disconnecting at the valves, and as the pipe is all straight pipe it can, when taken out, be used for any other purpose. The plain pipe system is divided into four sections, so that any one, or all, can be used as desired by shutting the valves. There are two sections on each side of the car, each extending half its length, and the steam enters the several sections at the ends of the car. The inner ends of each appear at W, W, W, W, fig. 1, which is a plan showing a portion of the car floor at the middle. Fig. 2 is a vertical section of the same portion of the car and fig. 3 shows the end of the car. A, figs. 2 and 3, is the main train pipe. Each radiator or section drains at both ends, so that it is easy to avoid any possibility of freezing. The water of condensation from these pipes is conducted into a tank 10 in. in diameter and 2 ft long F, fig. 2, placed at the centre of the car beneath the floor. On this there is placed a blow-off cock and automatic relief R, fig. 2, and a thermostatic trap H, fig. 2. It will be observed that in this tank there is placed between the discharge and the trap a relief valve



GOLD'S PLAIN PIPE SYSTEM OF CAR HEATING.

and strainer Q, the full diameter of the tank. This prevents dirt getting into the trap or relief valve to interfere with their operation. At either end of the car on the main supply pipe, at the lowest point, is placed a separator E, fig. 3, which separates the condensation from the steam at each car, so that there is no possibility of the water being blown through to the next car. This gives perfectly dry steam to each car; those at the end of the train, as well as the first car. To this separator is attached a small thermostatic trap, J, fig. 3, which is also provided with a strainer, so that no dirt can get into the trap. At the lower end of the separator is a plug, which can be removed at any time to clean the dirt out, should any accumulate. The coupling shown is the well-known Gold interchangeable coupling, with relief valve at the bottom, which, when steam is shut off, opens and lets out any water of condensation that remains in the pipes, thereby preventing freezing. The tank F, fig. 2, and the separator E, fig. 3, are shown in detail in figs. 4 and 5.

Track Watchmen.

BY W. H. K.

In these days of sharp competition and rigid economy, the leading question before the manager and superintendent is generally the expense account, and on many railway lines the revenue seems only to justify expenditures that are arbitrarily necessary, avoiding every outlay for betterments, or those which can possibly be omitted without crippling the train service. This question, like most other problems, has many phases, and offers a broad field for consideration and the use of practical good judgment in deciding where to draw the danger line, or to determine what risks may reasonably and lawfully be taken in handling traffic, and in general operation.

One of the most prominent Western managers on a strong line, whose service only terminated with his death, once stated to one of his assistants, when being urged to adopt a certain measure of extraordinary precaution: "Absolute safety to your trains can only be secured by holding them in yards or on side tracks, and not attempting to move them; so long as we are dependent upon the actions of men, mistakes will be made and accidents will occur." While we must all agree with this broad principle, it is equally certain

that vigilance, good discipline and constant watchfulness are productive of good results and form the groundwork for successful administrations, so often credited to good luck.

Ordinarily, the strong, successful lines have, in their prosperity, adopted all known safeguards, among which is a corps of watchmen, who guard their bridges, buildings and dangerous or obscure portions of their lines, while their less fortunate neighbors can neither afford the expense for mechanical safeguards nor for special watchmen, but must depend largely, if not altogether, upon their meagre track force to not only maintain the track and fences, but to guard the property intrusted to their care, besides protecting the trains traveling over the road. In the first case we shall find iron bridges, stone abutments and culverts, and a thoroughly substantial roadway, as nearly insuring safety as anything devised by human ingenuity can; in the other, everything temporary and of the cheapest character: wooden bridges, trestles and culverts, which from age soon become fire-traps, endangering the passage of every train; so that where the greatest necessity for extra care exists, the means for furnishing these precautions are the least.

Protection for life and property, as well as public policy, seems to require that some more uniform and systematic plan should be adopted in the operation of the latter class of roads, if they are to undertake to carry on the business of common carriers; and it seems likely that with good judgment much can be done, even on the weakest lines, to mitigate, if not to entirely obviate, the dangers referred to.

A watchman, to be of any practical value, must be a man who has had enough experience to appreciate the importance of his position, and who, in case of emergency, could be depended upon to protect the trains or property for which he is specially detailed; and as a rule such duty should not be complicated or divided by adding other work, which might be liable to divert the man's attention.

During severe droughts, when fires are liable to occur, such special watchmen should be detailed in sufficient numbers to patrol—if possible—the line between every train; first to protect the trains from running into burnt-out openings; second, to protect the wooden structures forming a part of the permanent way, and thirdly, the right of way, including fences, as well as adjoining property. In case special or



Fig. 1.
Regular Smith Sleeve Drill.

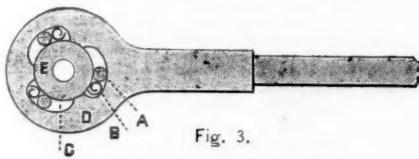


Fig. 3.
Cross Section Showing Working Parts.

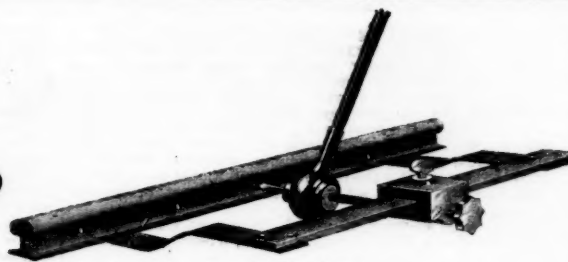


Fig. 2.—Track Drill.

THE SMITH FRICTION DRILL.

Made by the F. F. WATERS MANUFACTURING CO., Boston, Mass.

extra train service is being performed, extra vigilance should be exercised, and the force of watchmen increased. Supervisors or roadmasters should be required to know that men detailed to act as watchmen are competent, understand their duties, including the use of signals, and see that they are fully supplied with such signals as their duties may require them to use.

As a general thing at such times, when the services of watchmen are most necessary, the regular track force can be utilized without seriously interfering with their regular work. In very dry, hot weather the men cannot accomplish very much at their regular repair work; and during stormy seasons, such work is practically impossible. But the distinctive duty of the watchman must be recognized under all circumstances, no matter from what force or department the man is detailed. Velocipede hand cars can often be used to advantage, and in many cases will enable one man to thoroughly protect several miles of the line. Whenever wind or rain storms occur, track foremen should be required to detail their force to act as watchmen, until they can be specially instructed by their superior officers; but too much should not be expected from these men, for they have many responsibilities, and the usual salaries paid will not command the service of the highest order of efficiency; although, as a rule, the trackmen are the most faithful and vigilant of any class of labor in the railroad service. Train and enginemen should be trained to use great care and good judgment by running cautiously in time of danger, and to give opposing or following trains warning whenever from any cause they know of any threatened trouble. Let every one feel an interest in the common welfare and safety, and good results may be expected. As a matter of economy, the liberal use of watchmen, we believe, will be found to be a paying investment in the saving of life, property and delays as well as reputation.

Preventives may also be used to assist the watchmen. Whitewash liberally applied to wooden bridges, trestles, culverts and cattle-guards, if renewed every spring, will generally protect such structures against fire. The removal of all grass and weeds from the surface of the ground from around such wooden structures should be required, and the rule rigidly enforced. Constant vigilance by inspectors or their equivalent is the best safeguard, as disaster always comes from some unexpected quarter, ready to overcome any sleeping sentinel. If still the question of economy presses, let it be met in some other direction; better dispense with some of the superfluous reports or complicated statements, or reduce the soliciting or advertising expenses; but do not attempt to do without your proper quota of watchmen.

The Smith Friction Drill.

Among the several exhibits shown at the recent convention at Boston of the New England Roadmasters' Association was the Smith friction drill, of which we present illustrations in this issue. The tool is interesting in several respects and would seem to commend itself favorably for general use. As compared with the well-known form of ratchet drill important advantages are claimed for it, one of them being that it may be worked with good speed in the lost motion space of the ratchet, and another, that it has scarcely more than half the number of parts of the ratchet, and will stand harder work with less wear and tear.

Fig. 1 of our engravings shows the regular Smith sleeve drill, while fig. 2 represents the Smith track drill, both embracing the same working principle. This, in turn, is illustrated in fig. 3, which is a cross section, showing the arrangement of the working parts. It will be seen that the construction is very simple: The body *D*, which is one solid forging, is recessed at *C*, forming three cam surfaces, which, by a slight movement of the handle, set on the friction rollers *A*, causing them to tightly grip the body *E*, and revolving the latter, together with the drill point. Reversing the motion of the handle at once releases the grip of the rollers. The latter are held in position by the springs *B*.

All the working parts, the body *E*, the cam *D*, friction rolls and feed screw are of steel, drop forged and specially tempered. The Smith principle is applied also to a boiler drill, specially designed to work in contracted spaces. Another form, known as the combination friction drill, is made for taper and square shank drills with sockets, and the sleeve has a hexagonal top, to which a malleable iron wrench is fitted for the feed screws.

The makers, the F. F. Waters Manufacturing Co., 38 Oliver street, Boston, Mass., direct attention to the fact that any form of friction clutch applied to a hand-tool or drilling machine, in the manner illustrated, is a direct infringement upon their patents.

Messrs. Spierburne & Co., of Boston, are handling the track drill in New England.

The Hudson River Tunnel.

Work on the Hudson River tunnel has been progressing in a successful way during the past few weeks. Employed in the north heading at the western, or New Jersey end, are about 160 men, divided into three gangs, working eight hours each. The daily rate of advance now averages $3\frac{1}{2}$ feet of completed tunnel.

Two years ago the work was stopped because of lack of funds. Efforts to raise the necessary capital in this country failing, English engineers were interested in the undertaking, and the funds required were provided across the water. The exact financial aspects of the plan are not made public, but it is probable, judging from information obtained, that all the money needed to prosecute the work until the headings meet has been secured.

No change will be made in the plans, and the work will be carried forward by the aid of compressed air in the same way heretofore followed. The work has been finished as far as indicated by the following figures: From the New Jersey end, 600 ft. of the south and 1,900 ft. of the north tunnel; from the New York end, 50 ft. of the south and 200 ft. of the north tunnel. The distance between shafts is 5,600 ft.

We will briefly outline the method of building. Compressed air, furnished by compressors located at the mouth of the shaft, is led to the heading, where a pressure is maintained about equal to that of the head of water. This at the present time is about 34 lbs. to the square inch. In the completed tunnel, about 350 ft. from the face of the heading, is an air lock built in a masonry bulkhead. Four hundred feet from this are a second air lock and bulkhead. This practically divides the tunnel into three sections, the first of which, that adjoining the shaft, is subjected to air at a normal pressure, the next, or middle section, between the locks, is under from 15 to 18 lbs., while the third, or heading section, is under the full pressure. Supplies for the heading, and excavated material are handled in cars made to hold about three-quarters of a ton of silt, and of such size as to pass through the 3 x 4-ft. doors of the locks. The entire tunnel has been double tracked with 25-lb. rails.

Extending longitudinally, about at the centre of the heading, with its rear end braced in the completed masonry and its forward end projecting beyond the face and into the undisturbed silt, is the "pilot," which is a tube 6 ft. in diameter and built up of segmental flanged plates. From the pilot, which serves as a centre or hub, the plates forming the shell of the tunnel proper are braced. The excavation is made in sections from 10 to 12 ft. in length, the endeavor being to prosecute both digging and brick laying at the same time. Silt is dug first from the crown, then down the sides and face, plates being put in and bolted as fast as the work proceeds. The plates are of steel, curved to fit the circle, are 30 x 48 in., $\frac{1}{8}$ of an inch thick, and flanged on all sides by angles $\frac{3}{4}$ x 2 $\frac{1}{2}$.

When entirely excavated to the invert the heading measures approximately 22 x 24 ft. The masonry, brick, 30 in. thick, laid in Portland cement, is then started at the bottom, carried up both sides and over the crown. The exposed silt of the face requires no bracing whatever, it being tenacious enough to act as a perfect partition separating the compressed air and water. It is cut out in square blocks with shovels, and the shape is well preserved even when it has reached the dumping ground.

When the tunnel was reopened, about eight weeks ago, it was found that the silt had entered the work to the lock. This was so thoroughly mixed with water that it had to be removed in barrels. When the end of the brick work was reached a hole was found through the bed of the river, directly over the crown at the edge of the masonry. This was located by sounding from the surface, and was plugged with a ball about 10 ft. in diameter, made of hay, brick and mud inclosed in a canvas bag, having a net work of cord. This was then weighted with old rails.

Owing to the softened character of the silt, caused by the gradual movement necessary to fill the heading, the plan pursued at the New York end when passing through sand was here resorted to. The plates were cut into small pieces, one of which was inserted, bolted to those already in and braced if necessary. Piece by piece the shell was in this way put in and held until the masonry had been built. As soon as the hole had been passed and undisturbed silt reached no trouble was experienced.

It is a characteristic of the silt forming the bed of the Hudson that when disturbed and mingled with water it is an extremely hard task to confine it. But when it is given sufficient time in which to settle it forms a mass impervious to air, and having qualities which render it self-sustaining. For this reason the heading, which enters silt which has been resting undisturbed for ages, requires no outside support, its inherent tenacity being amply sufficient to enable it to maintain its own upright position. This feature also makes it admirably fitted to serve as a wall dividing the air from the water, and through which neither can pass.

In the working staff are Col. D. C. Haskin, Manager; Col. W. H. Paine, Engineer, and Mr. C. A. Haskin, Superintendent.

Train Accidents in July.

COLLISIONS.

- 1st, on Vicksburg, Shreveport & Pacific, near Meridian, Miss., passenger train ran into a preceding freight train.
- 5th, on Boston & Albany, near Wellesley, Mass., a freight train ran into a preceding freight, wrecking 5 cars and blocking both main tracks several hours.
- 7th, on New York, Susquehanna & Western, near Two Bridges, N. J., special passenger train ran into the rear of a construction train, disabling the engine. One passenger injured.
- 7th, night, on the Chesapeake & Ohio, at Greenbrier, W. Va., a passenger train ran into a car that had run from a siding out on to the main track. The train was moving rapidly, but there was only slight damage.
- 9th, on Boston & Maine, near East Pepperell, Mass., a north-bound freight train broke in two and the parts afterwards collided, making a bad wreck and blocking the tracks for 9 hours.
- 11th, on Baltimore & Ohio, near Burton, W. Va., a freight train broke in two, and the forward portion in returning for the detached section collided with it as it was being pushed forward by a helper, wrecking 3 cars.
- 12th, on Allegheny Valley, near Morningside, Pa., a freight train ran into a preceding freight, damaging engine and 4 cars.
- 12th, on Kansas City, Wyandotte & Northwestern, a freight car broke loose at Philadelphia, Kan., and ran down grade 8 miles into the Kansas City yard, where it collided with a locomotive, wrecking both.
- 13th, on Union Pacific, at Summit, Neb., a freight train ran into the rear of a preceding freight, disabling an engine and damaging several cars. A brakeman injured.
- 14th, on Boston & Albany, near Washington, Mass., a freight train broke in two, and the rear part afterwards ran into the forward one, wrecking 8 cars and blocking both main tracks.
- 14th, on Southwestern, near Smithville, Ga., a passenger train ran over a misplaced switch and into the rear of a construction train, doing some damage.
- 15th, on Louisville & Nashville, near Newcastle, Ala., freight train ran into a preceding freight, damaging several cars.
- 15th, on Northern Pacific, at Otis, Idaho, a passenger train ran into some box cars which a gale had blown out upon the main track. The engine and 4 cars were derailed and damaged. Fireman fatally injured by jumping.
- 17th, on Northern Central, near Shamokin, Pa., a passenger train was struck in the rear by two loaded coal cars which had run away from a colliery, a short distance above. The rear brakeman of the passenger train jumped off, and tried to derail the coal cars by placing sleepers on the track, but failed. A number of passengers got off before the collision, but 2 were killed and several injured. The coal cars were started by three boys, aged respectively 5, 9 and 11, who first turned the throw-off switch which was intended to derail any runaway cars before they should reach the main track.
- 17th, on Baltimore & Ohio, at Brandy Gap Tunnel, W. Va., a freight train, the speed of which was slackened as it approached a bridge undergoing repairs, was run into by a following freight, which was ordered to take similar precaution, but neglected to do so. Engine and 5 cars wrecked.
- 19th, on Central of New Jersey, at Bergen Point, N. J., a passenger train ran into some cars standing on the main track, doing considerable damage.
- 19th, on the Chesapeake & Ohio, at Huntington, W. Va., a mixed train ran into a switching engine, damaging both engines. Fireman injured.
- 21st, 2 a. m., on Union Pacific, near Kansas Falls, Kan., a passenger train ran into four freight cars which had been blown from a siding on to the main track. Two of the cars were completely wrecked, but no person was injured. It is thought that the brakes on the cars had been maliciously released.
- 21st, on East Tennessee, Virginia & Georgia, near Chattanooga, Tenn., a freight train ran into a preceding freight. Locomotive disabled and several cars damaged.
- 22d, near Warsaw, N. Y., a New York, Lake Erie & Western freight train ran into a preceding Lehigh Valley coal train; locomotive and 15 cars wrecked. The accident occurred in a cut and both main tracks were blocked for some time.
- 22d, on Philadelphia & Reading, near Muncy, Pa., a fast freight train broke in two and the rear portion ran into the forward one, wrecking 4 cars.
- 22d, on New York, Lake Erie & Western, at Middletown, N. Y., a freight train approaching the station broke in two and the detached portion ran into the forward one as it was coming to a stop in the yard, wrecking 10 cars.
- 22d, on New York, Lake Erie & Western, at Summit, N. Y., a heavy freight train broke into three parts. The different sections collided, wrecking 6 cars and a trestle. Brakeman injured.
- 25th, on Pennsylvania, at Johnstown, Pa., some runaway coke cars, to prevent collision with a passenger train, were turned on to a siding and dashed into some cars used by the employes as sleeping and eating quarters, wrecking several cars.
- 25th, on Fitchburg road, at Athol, Mass., a locomotive ran into the rear end of a freight train, doing some damage.
- 25th, on Philadelphia & Reading, at Landingville, Pa., passenger train ran into the rear of a coal train projecting over the main track from a siding. Engine and 4 following cars of passenger train derailed and damaged, as were also the caboose and several freight cars.
- 26th, on Central of New Jersey, near Dunellen, N. J., an

eastbound freight ran into the rear of a preceding freight which had broken in two but had just been recoupled and got in motion. Engine, caboose and 8 cars wrecked. The engineer and fireman were injured in jumping and a tramp killed.

26th, on West Jersey road, at Glassboro, N. J., collision between passenger train and yard engine. It is said that the air brakes on the former did not work properly.

26th, on Georgia Midland & Gulf, near Warm Springs, Ga., passenger train ran into the rear of a freight train going on to a side-track, damaging the caboose and disabling the engine.

26th, night, on Baltimore & Potomac, near Waterloo, Va., a passenger train ran into the rear portion of a freight, which had been stalled on a grade and was being hauled in sections. Engine, caboose and 15 cars damaged. Engineer and conductor injured, and a tramp stealing a ride was badly injured. A heavy fog prevailed.

26th, on St. Louis & San Francisco, at Caston, I. T., freight train ran into the rear of a freight standing in the yard, wrecking caboose and 3 cars. Two passengers in the caboose injured.

27th, on Pennsylvania road, at Blairsville, Pa., a freight train ran into the rear of a preceding freight, damaging engine and wrecking 5 cars.

29th, on Southern Pacific, at Saugus Junction, Cal., freight train ran into rear of a preceding freight, wrecking caboose and two cars.

29th, on Central of Georgia, at Macon, Ga., a switching freight ran into the rear of another freight train, wrecking several cars.

30th, on Chicago, Milwaukee & St. Paul, near Alton, Ill., a freight train ran into the rear of a preceding freight, wrecking 5 cars.

31st, on the Galveston, Harrisburg & San Antonio, at Fabens, Tex., a Texas & Pacific train while standing at a water station was run into at the rear by a freight, wrecking a caboose and several cars.

BUTTING.

2d, on Pittsburgh, Fort Wayne & Chicago, at New Castle, Pa., butting collision between a freight train and a yard engine, damaging both locomotives and 1 car. The conductor jumped down 25 ft. into the Shenango River, but came out uninjured.

4th, on Chicago, Burlington & Quincy, near Fairfield, Ia., butting collision between westbound passenger No. 3 and eastbound freight, third No. 12. The trains had orders to meet at Glendale, a flag station, but the conductor and engineer of No. 3 forgot the order and passed that point. The passenger train had wholly stopped and the freight train had reduced its speed to 20 miles an hour before the collision. Twelve cars of the freight had the air brake. Baggage car and 8 freight cars badly damaged. An express messenger was killed.

4th, 9 p. m., on Chicago, St. Paul & Kansas City, near Fairgrounds, three miles north of Dubuque, Ia., butting collision between an empty passenger train and a freight. The passenger train was running on the time of the freight, having failed to stop at Fairgrounds for orders. One workman killed, engineer and 4 passengers injured. The track was blocked till morning, and several hundred people at a picnic at Twin Springs, who were waiting for the passenger train to take them to Dubuque, were compelled to remain out all night.

6th, on Pennsylvania, near White Hill, N. J., butting collision between a construction train and a light engine. Both engines wrecked.

6th, on New York, Pennsylvania & Ohio, near Kennedy, N. Y., butting collision in a fog between a passenger train and a freight train, which was running in violation of orders, the forward portions of each train being badly damaged. Two trainmen killed and 2 trainmen and 1 passenger injured, the latter in leaping from the train.

8th, on Chicago, Milwaukee & St. Paul, near Coon Rapids, Ia., butting collision between a passenger train and a work train, wrecking two engines and several cars. Fireman killed, engineer and baggageman injured. The work train had a flag out, but it was raining hard, and the engineer did not see it. It does not appear that torpedoes were used.

9th, on Delaware & Hudson Canal Co.'s road, near Waterford, N. Y., butting collision between a freight train and a construction train running in violation of orders. One laborer killed.

10th, on Pittsburgh & Castle Shannon, near Pittsburgh, Pa., butting collision between a mixed train and a gravel train on a high bridge. On the latter were a number of laborers, of whom 6 were injured. One engineer and another laborer were killed.

10th, on Cincinnati, New Orleans & Texas Pacific, at Oakdale, Tenn., butting collision between two passenger trains, one of which entered the station five minutes ahead of time.

10th, on Pittsburgh, Cincinnati & St. Louis, near Nimick station, Pa., butting collision between an accommodation train and an empty engine. Both engines disabled and several cars derailed.

10th, on New Haven & Derby, near Orange, Conn., butting collision between a passenger train and a special freight train. Engineer injured by jumping.

13th, on Western New York & Pennsylvania, near Petroleum Centre, Pa., butting collision between a freight and an empty engine which was on a trial trip. A brakeman was killed, and the master mechanic and engineer of the empty engine and both men on the other were injured. Both engines badly wrecked.

13th, on New York, Susquehanna & Western, at Butler, N. J., a milk train ran over a misplaced switch and into the head of a freight train standing on a side track, wrecking both engines and 4 cars. Four trainmen injured.

13th, on New York, Lake Erie & Western, in Paterson, N. J., collision between switching passenger train and a string of runaway freight cars. Engine and several box cars wrecked. The engine was overturned and the wreck caught fire and was partially consumed. Fireman killed.

13th, on Philadelphia, Wilmington & Baltimore, at Perryville, Md., collision between a passenger train and a yard engine, damaging both engines and derailling 1 car.

14th, on Missouri, Kansas & Texas, near Booneville, Mo., butting collision between a northbound special stock train and a southbound freight running in violation of orders. Both engines and several cars damaged.

15th, on Southern Pacific Co.'s road, at Sierra Blanca, Tex., 3 cars of a switching freight got away from the trainmen and ran down grade some distance into the head of a freight train, wrecking the engine and 5 cars. Engineer and fireman injured.

15th, on Louisville & Nashville, at Boyles, Ala., a freight train ran over a misplaced switch and into the head of a freight standing on a side-track, disabling both engines.

15th, on Pittsburgh, Ft. Wayne & Chicago, near Valparaiso, Ind., butting collision between accommodation and freight trains, damaging both locomotives and ditching one coach.

15th, on Natchez, Jackson & Columbus, near Fayette, Miss., butting collision between two freight trains, damaging the engines.

18th, on Cleveland, Cincinnati, Chicago & St. Louis, near

Greenburg, Ind., a freight train descending a grade broke in two. The engineer in trying to evade the detached section collided with a passenger train, wrecking both engines. A postal clerk was injured and a tramp killed.

18th, on Savannah, Florida & Western, at Eighty-second Mile Post, Ga., a passenger train ran over a misplaced switch and into the head of a freight train standing on a side track. Fireman killed and three other trainmen injured. It is said that the switchman, who was waiting to turn the switch after the passenger train should have passed, became confused and set it for the siding just before the passenger reached it.

23d, on the Missouri, Kansas & Texas, at Caney, I. T., butting collision between freight trains, wrecking a number of cars.

24th, on Pennsylvania road, at Bedford, Pa., butting collision between freight trains, damaging several cars. A fireman was killed.

24th, on the New York, Pennsylvania & Ohio, near Creston, O., butting collision between freight trains. Engineer injured.

31st, on the Cincinnati, Hamilton & Dayton, near Ogleton, O., butting collision between a passenger train and an empty engine, badly wrecking the engines. A fireman was killed and 5 other trainmen were injured. The engineer says he "forgot all about the regular train."

31st, on Hannibal & St. Joseph, near Nettleton, Mo., butting collision between freight trains, wrecking an engine and 6 cars. It is said that the east-bound train failed to stop at the proper place for orders.

31st, on Philadelphia & Reading, near Merion, Pa., butting collision between freight trains, wrecking several cars.

CROSSING AND MISCELLANEOUS.

9th, at a crossing in Grand Island, Neb., a Burlington & Missouri River passenger train was run into by a Union Pacific engine, doing some damage.

11th, on Central of New Jersey, in Newark, N. J., collision between two passenger trains at a crossing, doing some damage. Five passengers injured.

13th, on New York, New Haven & Hartford, in Hartford, Conn., passenger train ran over a misplaced switch and into the side of a freight train, derailling 4 cars.

19th, on Burlington & Missouri River, at York, Neb., passenger train ran into a freight switching on the main track, derailling several cars.

19th, on the New York Central & Hudson River, at a junction near Rochester, N. Y., a freight train approaching from the Charlotte Branch was run into by one from the Buffalo, Rochester & Pittsburgh, derailling 2 cars and damaging the engine.

23d, at Columbia, S. C., a freight train of the Richmond & Danville was run into by a South Carolina freight, wrecking several cars.

23d, on Valley road, near Brookville, O., passenger train ran into a freight going on to a siding, doing considerable damage.

25th, on the Chicago & Alton, at Mitchell, Ill., a freight train backing out of a side track was run into by another freight, wrecking a number of cars of fruit. Two trainmen injured.

DERAILMENTS.

DEFECTS OF ROAD.

5th, on Baltimore & Ohio, at Mineral Siding, O., a bridge gave way under a freight train, 7 cars going down with it. 5th, on Waynesburg & Washington, near Hackney's, Pa., a trestle gave way under a freight train and 7 cars went down into a creek.

8th, on New York, New Haven & Hartford, at Westfield, Mass., the engine and all the cars of a passenger train derailed by a defective guard rail.

16th, on Cincinnati, New Orleans & Texas Pacific, at Birmingham, Ala., the rear sleeping car in a passenger train was derailed and overturned by the breaking of a bolt in a three-throw switch. Several passengers slightly injured.

18th, on Louisville, Evansville & St. Louis, near Booneville, Ind., passenger train thrown from the track by the spreading of the rails.

19th, on Columbus, Hocking Valley & Toledo, near Logan, O., several cars of a coal train derailed by a broken trestle.

28th, on New Orleans & Shell Beach, near New Orleans, La., passenger train derailed by the spreading of the rails, injuring engineer and 1 passenger.

DEFECTS OF EQUIPMENT.

4th, on Southwestern, near Howard, Ga., 16 cars of a freight train were derailed by the breaking of an axle, and wrecked.

7th, on Western New York & Pennsylvania, near Canadea, N. Y., several cars of a freight train derailed by the dropping of a brake-beam.

7th, on Pittsburgh & Western, near Akron, O., engine of passenger train was derailed and wrecked by a broken axle, killing the engineer and injuring the fireman and a man riding on the engine.

9th, on New York Central & Hudson River, near Hoffman's, N. Y., a truck under a car in a freight train broke, wrecking a portion of the train and blocking the road for several hours.

9th, night, on Laurel Fork & Sand Hill road near Volcano Junction, W. Va., a freight car in a mixed train jumped the track, derailling and overturning a passenger car behind it. Two passengers slightly injured. The car was heavily loaded and would not follow the curve.

10th, on Pennsylvania, near Wilmerding station, Pa., a car in a freight train was derailed by a broken wheel and immediately took fire, destroying 13 cars. A man in charge of horses injured, 1 tramp killed and 3 tramps injured.

12th, on Jacksonville Southeastern, near Greenfield, Ill., baggage car and one coach of a passenger train was derailed by a broken axle. One passenger killed and several others injured.

21st, on Fremont, Elkhorn & Missouri Valley, near Norfolk, Neb., freight train derailed and ditched by a broken wheel. One trainman injured.

28th, on Fitchburg road, in Boston, Mass., a locomotive hauling some stock cars was derailed by the breaking of a driving-wheel tire and struck some freight cars standing on an adjoining track. Engine and 2 cars damaged.

31st, on Philadelphia & Reading, near Hamburg, Pa., 16 cars of a freight train derailed by a broken axle.

NEGLECTANCE IN OPERATING.

12th, on New York, Lake Erie & Western, in Rochester, N. Y., a freight train was derailed by a misplaced switch and demolished an adjacent dwelling.

15th, on New York, Pennsylvania & Ohio, near Sharon, Pa., freight train derailed and wrecked by a misplaced switch.

18th, on Texas & Pacific, near Colorado, Tex., engine and 5 cars of a freight train were derailed at a point where sectionmen had removed a rail for repairs and put out the flag such a short distance that the train could not be stopped.

23d, on the Union Pacific, at Omaha, Neb., 5 cars of a freight train derailed by a misplaced switch.

24th, on Louisville, New Orleans & Texas Pacific, near La Place, La., a freight train was derailed at a point where track repairs were in progress and the sectionmen had

neglected to take proper flagging precautions. Engine and 5 cars wrecked.

26th, on New York, Providence & Boston, at Northbridge, Mass., several cars of a freight derailed and wrecked by a misplaced switch.

27th, on the Chesapeake, Ohio & Southwestern, at Brighton, Tenn., passenger train No. 7 derailed by a partially thrown split switch, wrecking the engine and 2 cars. Mail agent killed and 3 trainmen injured.

27th, on Old Colony, at Providence, R. I., passenger train moving backwards in the yard for the purpose of leaving a car was derailed at a misplaced switch.

27th, on the Chesapeake & Ohio, at Meadow Creek, West Va., engine and several cars of a freight train derailed at a split switch, which was prevented from closing tightly by a small stone.

28th, on Central of New Jersey, at Jersey City, N. J., passenger train approaching the station was derailed by a misplaced switch, doing considerable damage to the track.

31st, on St. Paul & Duluth, near Barnum, Minn., 10 cars of a freight train derailed by a stone which fell from the second car to the track. The ten cars were all wrecked and one brakeman was injured.

UNFORESEEN OBSTRUCTIONS.

2d, 1 a. m., on Norfolk & Western, near Thaxton's, Va., eastbound passenger train No. 2 was derailed by a washout, the whole train except the 2 rear cars going down about 25 ft. into a gap 90 ft. long. The rainstorm was very sudden, and it appears that the water had risen to within 2 ft. of the track. A freight train had passed the spot only 30 minutes before. The rails and sleepers held together until the weight of the engine broke the splice-bars, and it may be that the ballast immediately under the rails had not been washed away when the train came upon it. The engineer did not even shut off steam. The place of the accident being at the foot of a grade. About an hour after the accident the wreck took fire from the locomotive firebox, and was burned up, together with the bodies of several of the victims. Six employees and 4 passengers were killed, and 7 employees and 14 passengers injured.

4th, on Carolina Central, near Wadesboro, N. C., several cars of an accommodation train broke through a culvert, which had been impaired by a freshet.

4th, on Chesapeake & Ohio, near Ona, W. Va., a passenger train ran into a landslide, derailling and damaging engine and several cars. Engineer and fireman killed.

10th, on Central Vermont, near Brandon, Vt., a passenger train was derailed at a point where the roadbed had been washed away by heavy rains. The locomotive was thrown over on its side. One trainman and 7 passengers injured. A lamp was overturned and the oil caught fire, but it was immediately extinguished.

15th, on Southern Pacific Co.'s line, near Rincon, Cal., a passenger train ran over a cow. The engine and a baggage car were derailed, the former being overturned and badly wrecked.

19th, on Meriden, Waterbury & Connecticut River, near Meriden, Conn., a mixed train, consisting of engine, four freight cars, a combination baggage and passenger car and one coach, was derailed by a malicious obstruction near a trestle. The engine and freight cars were tipped off the trestle and wrecked. Three trainmen injured.

19th, on Scioto Valley road, near Chillicothe, O., a freight train ran into a washout, ditching the locomotive and 17 cars.

19th, on the New York, Susquehanna & Western, near Hackensack, N. J., engine of a passenger train derailed by running into a washout. The engineer had, however, brought the train nearly to a stop.

25th, on the Minneapolis & St. Louis, at New Prague, Minn., five cars of a freight train were blown from the track by high wind.

28th, on the Southern Pacific, at Lebanon Junction, Or., a passenger train derailed by a maliciously misplaced switch. Engine and 2 cars badly damaged and 2 trainmen injured.

30th, on New York Central & Hudson River, at Williamsbridge, N. Y., forward truck of engine of passenger train derailed at a point where the track was submerged.

31st, on Chicago, St. Louis & Pittsburgh, near Newcastle, Ind., engine of a passenger train derailed by a sleeper which had been maliciously placed on the track. One passenger and one trainman injured.

UNEXPLAINED.

2d, on Naugatuck road, near Seymour, Conn., 11 cars of a freight train derailed and wrecked. One trainman injured.

3d, on Central of Georgia, near Birmingham, Ala., several cars of a freight train derailed.

3d, on Southwestern, near Geneva, Ga., engine and 2 cars of a passenger train derailed and ditched. Six passengers injured.

4th, on New York, Philadelphia & Norfolk, near Eastville, Va., engine and one car of a freight train derailed.

4th, on St. Paul & Duluth, at St. Paul, Minn., two engines hauling a passenger train were derailed, injuring 2 trainmen.

8th, on Boston & Albany, at Brookfield, Mass., engine of a freight train derailed at a switch, blocking both tracks two hours.

9th, on Chicago, Santa Fe & California, near Baring, Mo., work train derailed. Fireman killed, engineer injured.

10th, on Walkill Valley road, near Walkill, N. Y., passenger train derailed.

13th, on Cleveland, Cincinnati, Chicago & St. Louis, near the Grand Central Depot at Cincinnati, O., a locomotive was derailed.

14th, on Atlanta & Florida, at Knoxville, Ga., a mixed train was derailed. A coach was overturned, slightly injuring several passengers.

15th, on Southwestern road, near Geneva, Ga., freight train derailed and wrecked.

16th, on Southwestern, at Upatoi, Ga., caboose and several cars of a freight train derailed.

17th, on Cairo, Vincennes & Chicago, near Mt. Carmel, Ill., all but the engine of a passenger train, consisting of a box car, baggage car and two coaches, was derailed, thrown over an embankment and wrecked, injuring 12 passengers.

19th, on Pennsylvania road, at Wayne, Pa., a coal train was derailed and 13 cars were piled up in a bad wreck, blocking the track for some time. A brakeman was thrown from the train and injured.

20th, on St. Louis, Iron Mountain & Southern, at Helena, Ark., caboose and 3 cars of a freight train derailed and damaged.

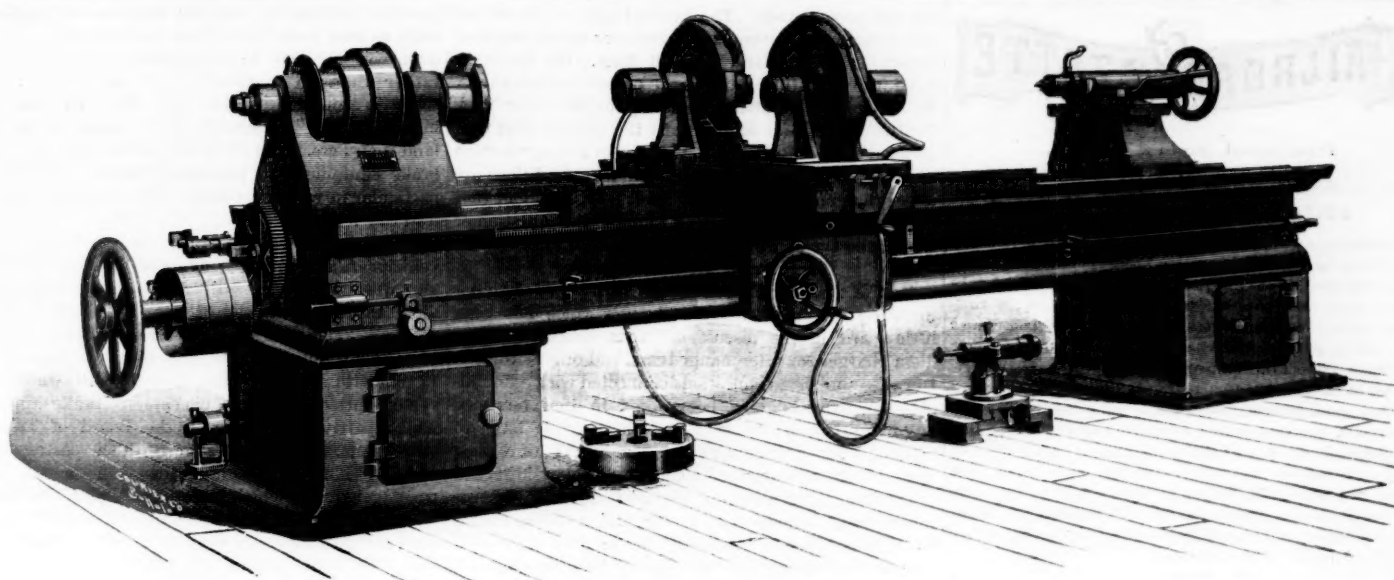
20th, on Atlantic & Pacific, at Rio Puerco, N. M., engine and 6 cars of a freight derailed, 1 car being wrecked.

21st, on East Tennessee, Virginia & Georgia, near Brunswick, Ga., engine and 4 cars of a freight derailed and wrecked. Engineer and fireman killed and 3 other trainmen injured.

22d, on Northern Pacific, near Missoula, Mont., freight train derailed, wrecking 5 cars.

23d, on New York, New Haven & Hartford, near Westfield, Mass., a combination baggage and smoking car in a passenger train was derailed at a frog and stripped off its trucks.

23d, on Pennsylvania, at Smith's Turnout, N. J., a train of empty coal cars approaching a bridge was derailed. A



SHAFTING GRINDER.

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number of cars were wrecked, and others were thrown into the canal and down an embankment.

24th, on Long Island, at Far Rockaway, N. Y., engine and 4 empty cars of passenger train derailed. The cars caught fire and were damaged.

24th, on Birmingham Mineral, near Bessemer, Ala., engine of freight train derailed and upset.

24th, on Knox & Lincoln, at South Newcastle, Me., freight train derailed and 1 car wrecked.

24th, on Pennsylvania, at Johnstown, Pa., freight train derailed.

24th, on Pennsylvania, near Monmouth Junction, N. J., freight train derailed and 3 tank cars containing oil were wrecked.

27th, on South Carolina road, near Aiken, S. C., a passenger train was derailed and overturned, 2 cars being wrecked. Engineer and fireman injured.

29th, on Lime Rock Railroad, at Rockland, Me., a freight train, consisting of engine and 13 cars, was derailed and wrecked.

30th, on St. Louis, Iron Mountain & Southern, at Little Rock, Ark., a freight train was derailed and a number of cars were thrown off an embankment into the Arkansas River. One trainman injured.

30th, on Baltimore & Delaware Bay Road, near Woodland Beach, Md., engine of passenger train derailed.

OTHER ACCIDENTS.

1st, on Mobile & Birmingham, near Mt. Vernon, Ala., engine of passenger train disabled by a broken truck.

16th, on Union Pacific, near Topeka, Kan., a yard engine exploded its boiler. Engineer and fireman fatally injured.

29th, on Third avenue line of the Manhattan (Elevated), near Grand street station, in New York City, engine of passenger train disabled by the breaking of an axle.

A summary will be found in another column.

German Railroad Travel.

The German railroad coach is a little better than the French coach of the same class, and the English is better than the German. An English third-class is about the same in comfort and finish as a French second-class. The German and English second-class are about alike, except it be that the English is cleaner than the German. The French first-class is a little better in the average than the English second-class, except on special trains. On such trains the cars are often very fine, indeed. The German knows no competition, owing to the system of state control, and the cars are uniformly good, the same for all, and without much departure from the standards adopted by the government for all roads.

In Germany a through train of 16 cars has several first-class compartments, not as many as in an English train, nor as few as in a French train of the same general character. A first-class compartment on a German train is often arranged for three persons only. The three seats being all on one side, with foot-rests for the passengers' feet on the opposite side. These foot-rests are adjustable, and can be folded away when not needed. When completely down they support one's legs as far up as the knees. The backs of the seats are high, and form a very satisfactory head-rest. The width of each seat is greater than in almost any other European first-class cars. In such seats one can take a very comfortable nap.

The ventilation of the German cars is by the side windows and by sliding registers above the windows, entirely at the control of the passengers.

The cars are heated in cold weather almost invariably by steam from the locomotives, which is admitted to one large pipe under each seat in each compartment. The passengers are permitted to regulate the temperature at will by the manipulation of a small handle from "hot" to "cold," as may be desired. Steam heating has been in successful use in Germany for several years past.

The lighting is by the Pintsch system, the lamps being in the roof and lighted from overhead, as is the general European custom. If the passenger desires to reduce the light, there are pretty silk curtains arranged on a hoop, which one can draw over one-half or all of the light at will. If gas is used, then the movement of the curtains operates the plug of the gas cock and lowers the flame to about one-third of its original height when the curtains are pulled down.

Smoking compartments are provided in almost every train, but if one obtains the permission of his companions in his compartment he may smoke almost anywhere. However, in no case must he use the weed in those compartments marked for ladies, or the unfeeling guard will create no end of trouble and mortification.

Traveling, so far, then, is not disagreeable, and when, as in some of the first-class cars, a long table can be unfolded from the side of the compartment to receive the mug which the station boys pass through the window, and which one may keep for the small sum of 8 cents for the mug and half litre of beer of good quality, he feels quite pleased and wishes for nothing better. But this is not all. The constant jolt of the 4-wheeled cars over the low joints and rough track becomes after a while extremely unpleasant and often painful. Mr. Sandberg has made the *Railroad Gazette's* readers familiar with the fact that German railroad track is rough, and will be so till heavier rails are used. The smoke not infrequently rolls in at the window, and the passenger desires to relieve his hands of the collection, and enters the lavatory through a most promising door. He finds a small compartment, about 3 ft. by 3 ft., sees a wash-bowl, a soap-dish, a water-bottle with glass stopper, and a glass to drink from. He opens another small door, enters another 3 ft. by 3 ft. compartment, and sees a water-closet seat. That is all, the total of a German first-class lavatory; no soap or towels, and but water enough to wash one hand at a time. But he finds on the wall a placard about 9 in. by 9 in., which states the contents of the apartment as follows: "What should be in this lavatory: 1 wash-bowl, 1 water-bottle, 1 water-bottle stopper, 1 soap dish."

A toilet, however, can be made, for every one has a handkerchief, even if he does hate to use it for a towel, and down in the bottom of the traveling bag, below the guide books, is a piece of soap and by means of these, in time for the dinner in the dining car, enough snot can be removed to make a presentable appearance at least. Through the window in the compartment, after much wrangling, a ticket is secured for dinner in the dining car from an officer whose dignity is such that you firmly believe his assertion that the car will be filled unless you are quick and get your location. One, then, being armed with a formidable number on a ticket, watches for a station where the time of stop is long enough to permit him to reach the head of the train, where the dining car is placed, and after having been huddled back into his pen several times by an angry guard, who fairly howls, "This is not your station," he wonders if he is really some animal in a Chicago stock train, but soon he succeeds in reaching the platform of the dining car, to be pulled in by its guard just as the train starts. The tables are but partially filled, and he wonders if he is late or early, but he is neither. The fabrication of a full car is only an American importation of the man who sold him the ticket—it goes with the dinner. Here a place to wash is given and a "one-for-all" towel is furnished. Seated in a cane chair, at a small table, opposite a red and hearty son of Deutschland, the dinner commences. No "menu" is furnished, but you are expected to buy wine from the wine card, and you have been importuned by the dinner ticket seller to "choose your wine now so that you can have it early at the table." The dinner is an unknown soup in cups, one "joint" in a large platter with all the vegetables, lettuce salad, stewed cherries, boiled rice, cheese of great penetration, bread, butter and coffee. The meal is over, you pay 75 cents for the food, 40 cents for the wine, 8 cents extra for the coffee, and 10 cents for the waiter, who assists you to alight and tells you to run hard or you will be left by the train, as it only makes a short stop. And so you would did not the guard see your difficulty and a 20 pfennig tip as he opens the door of a convenient compartment and allows you to enter a car, not your own, but in the same train. At the next stop you complete the change and reflect on the days when you maligned the American dining car with its clean linen and its oysters on the half shell (even when the shells were borrowed from preceding oysters). Then you think of

the end entrance through which you slowly perambulate back to your seat, stopping meanwhile to chat with a friend, and you wish you could have all Germany in the United States for one transcontinental journey on an American train. So it is not all fun traveling in Europe.

Each fraction of a journey in Deutschland must have its own individual ticket, and therefore the through traveler carries a bundle of sheets of rather heavy paper, about 3 in. x 4½ in., which is constantly demanded by the guard, who knocks for one to open the window, leans both arms on the sills, holds on by his elbows and extracts the "billet," meanwhile holding others in his teeth. He often chats pleasantly with the voyagers in each compartment, and seems not to mind his dangerous position. Woe befalls the traveler who has a book of tickets with an error in it. If the ticket seller has selected one wrong ticket for the bundle trouble begins. If your ticket calls for a most unreasonable station, or a most unusual departure from the main line, even if the ticket suddenly ends at a country town and commences at some point on the main line again, away you must go to the country station or wrangle with the local agent until after the train you desired has passed beyond your reach. This will be fully impressed on one's memory after he has been ousted from a rather comfortable car at 11:30 p. m. and made to wait at a country station until 3:40 a. m., because pages 36 and 37 of the ticket called for a triangular journey to Eger, a country town, instead of to Redwitz, a point on the main line. While lying on a sofa in the porter's room at 2 a. m., one's mind naturally wanders to that good old country where tickets could be carried in the vest pocket rather than in a strap, and the terminal points were alone mentioned, pages 36 and 37 being omitted.

The problem of the German dining car service has been solved. It is simply this: it is run by the local restaurant at one of the stations where its journey terminates. A thorough knowledge of the restaurant removes all wonder at the car service, and the ambitious dinner ticket seller is now known to be the "runner" of the railroad restaurant.

Shafting Grinder.

We illustrate herewith a machine for grinding cylindrical or tapering work, either on centres or when held in a chuck. It is so constructed as to swing heavy work, the bed being supported upon hollow pedestals, forming closets for the reception of small tools and fixtures, and the bed being closed up at the bottom, to form a trough or reservoir for holding water, which is forced in a stream on to the work by a pump, which is part of the machine. The liberal supply of water prevents heating and expansion of the work, greatly facilitating the grinding, and enabling more accurate work to be done than would otherwise be possible. The carriage carries two emery wheels, and is fed back and forth over the bed by a lead screw, which passes through under its centre and is connected by a split nut, which can be opened and shut the same as on a lathe. The carriage can also be moved by hand, the same as a lathe carriage.

The machine is furnished with only one wheel when desired, in which case a steady rest is furnished. An extra head is furnished to run on the carriage, which carries a small wheel for grinding the inside of wheels or other work held in the chuck on the spindle, and such holes can be ground straight or tapering. The feed work and slide of the machine are covered and fully protected from emery and dust. The motion of the carriage is automatically reversed by means of adjustable tappets on a rod, which is in front of the bed.

The bed is 12 ft. long, and work 8 ft. long, 22 in. diameter can be swung on the centres and over the carriage. Emery wheels from 14 in. to 20 in. can be used. The bearings of the emery-wheel spindles are 2 in. diameter, 4 in. long, the main spindle being 2½ in. diameter, with bearings 6 in. and 4½ in. long. The machine is built by the Springfield Glue & Emery Wheel Company, Springfield, Mass.



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EDITORIAL ANNOUNCEMENTS.

Contributions.—Subscribers and others will materially assist us in making our news accurate and complete if they will send us early information of events which take place under their observation, such as changes in railroad officers, organizations and changes of companies the letting, progress and completion of contracts for new works or important improvements of old ones, experiments in the construction of roads and machinery and in their management, particulars as to the business of railroads, and suggestions as to its improvement. Discussions of subjects pertaining to ALL DEPARTMENTS of railroad business by men practically acquainted with them are especially desired. Officers will oblige us by forwarding early copies of notices of meetings, elections, appointments, and especially annual reports, some notice of all of which will be published.

Advertisements.—We wish it distinctly understood that we will entertain no proposition to publish anything in this journal for pay, EXCEPT IN THE ADVERTISING COLUMN. We give in our editorial columns OUR OWN opinions, and those only, and in our news columns present only such matter as we consider interesting, and important to our readers. Those who wish to recommend their inventions, machinery, supplies, financial schemes, etc., to our readers can do so fully in our advertising columns, but it is useless to ask us to recommend them editorially, either for money or in consideration of advertising patronage.

We print in another column some authentic figures in relation to roller journal bearings for railroad vehicles. This subject of roller bearings is one that has been brought to the attention of railroad engineers often in the past, but never with such a firm determination to have its qualities—whether they be good or bad for railroad service—appreciated to a reasonably full extent. It therefore would seem to be in order to settle the question of the value of such bearings as a means of reducing train resistance once for all. We now know that the effort required to start a train fitted with them is less than that required to start the ordinary train, yet we do not know that at high velocities the friction of roller bearing journals is less than that of sliding bearings. No satisfactory estimate of the value of roller bearings can be made without a few tests of the resistance of cars fitted with such bearings, made with a dynamometer car.

The features of the week in the Northwestern rate problem have been Chairman Cooley's utterances at Chicago and Chairman Walker's decision on commodity rates, in which he goes into the general subject of "Soo route" competition and rate wars in general. Judge Cooley's words are reported in our traffic column, but Mr. Walker's decision is too long for reprinting. It strongly states the considerations by which the most conservative traffic managers are sometimes forced into rate wars, and it should receive a wide reading by railroad men who have not well-defined notions on this subject, and by people who have a well-defined notion that traffic managers are wholly to blame for rate wars. Mr. Walker points out the strong position of the Lake Superior lines, and tells Chicago in effect that it need not be scared at low through seaboard rates to St. Paul over the Northwestern roads, for such rates cannot injure Chicago's trade any more than the Soo routes have already injured it. Some considerations concerning Chairman Cooley's interview with the Chicago men are set forth in a communication printed in another column. Our correspondent states his views with vigor, but they voice a feeling which shows itself in several quarters. The Northwestern men evidently intend to make a through tariff and have it published in Eastern cities, with a view to meeting Chairman Cooley's criticism that the 15-cent announcement at Chicago was illegal. The movement to get the trunk lines to join in such publication of through rates would seem to have considerable prospect of success.

Running of extra trains without issuing a special train order from the dispatcher's office in each case was referred to last week in an article on Train Dispatching as "The Burlington's new plan," by which was meant a plan that was new on the Burlington road; but the incompleteness of the statement has led a correspondent to write us that the practice is not new. This we were aware of. It was not said that the C. B. & Q. was the only road, or the first one, to make this change. The comparisons made were general, and exceptions are, of course, numerous, as was implied in

the statements made. The Pennsylvania sends out not only freights, but even extra passenger trains, without dispatcher's orders and without flags. On the other hand, the Erie still continues the practice which the C. B. & Q. has just abandoned. Again, the New York Central's practice is substantially the same as that now adopted by the Burlington, though on a large portion of its road (the four-track system) the conditions are easier than on any two-track road. It is evident that practice is sufficiently varied to make the question of what is best well worthy of consideration.

Most of the New England roads turn a cold shoulder upon the Time Convention, and their voice has been little heard in the discussions upon demurrage, per diem charges for interchanged cars, and other subjects. But these important questions connected with economical management cannot be ignored in that territory any more than in any other, and these roads have to face facts the same as the rest. The New York & New England has now pursued a consistent policy in regard to the first of the above-mentioned features of the current reform for more than a year, and it seems that it has at length induced its neighbors to join it, the following vigorous circular having just been issued jointly by the Boston & Albany, Fitchburg, Central Vermont, New York & New England, and Boston & Maine. They say:

With proper use, the number of freight cars in service is amply sufficient to meet all ordinary demands. The misuse of cars by consignees, which occurs when they do not unload their freight within a reasonable time after its arrival, results in the supply being unequal to the demand and in serious inconvenience to shippers. Believing that the interest of the public and of the railroad companies alike will be served by establishing fair regulations which will tend to correct the evil referred to, the companies named below give notice that, taking effect September 1, 1889, in all cases where the duty of unloading freight devolves upon the consignee, provided such freight is not removed from the cars within 48 hours after they are placed upon the delivery tracks at destination, and in all cases where freight is stopped in transit at the request of the owner, and is not reforwarded or removed from the cars within 48 hours, the following tariff will be charged for storage of freight then remaining in cars: For the first five days, 3 cents per ton per day, but not less than 30 cents per car per day. For the second five days, 5 cents per ton, but not less than 50 cents per car per day. For each succeeding day, 10 cents per ton per day, but not less than \$1 per car per day. The ton will be reckoned at 2,000 lbs. In computing the time, Sundays and legal holidays will not be included in the original period of 48 hours, but each day thereafter will be counted. The railroad companies reserve the right to unload and store all freight. No freight will be delivered until all the storage and unloading charges which have accrued have been paid.

This places the matter upon a rational basis. The rates are so low that there can be no reasonable ground for complaint, and complaints from unreasonable people should be by this tariff reduced to a minimum. The New York & New England has been charging 75 cents a day, which is certainly a very moderate price, but there will perhaps be no harm in a 30-cent rate, at least as an experiment. Any rate that will move the goods promptly is high enough. Computing the charges by the ton will add to the clerical work, but it will remove all occasion for disputes about the capacity of cars, and is, moreover, the only business-like way. Car-loads of coal now vary from 4 tons to 30 or more, and a charge per car is quite crude, to say the least. Many kinds of freight handled in car-loads competes with that which is handled in smaller quantities and habitually unloaded by the railroad men, so that any kind of storage charge, to be just, must sooner or later be applied impartially to bulk freight and house freight alike. Something more accurate than a car rate is therefore a necessity. It would seem fair, though, to have a proviso that the charge should be upon the total weight of the original shipment until the car was empty, as otherwise there should be a larger minimum than 30 cents on cars of, say, 20 tons capacity. This is a good season to inaugurate this change and traffic should be heavy enough this fall to give the new scheme an extended lease of life, but the test must come, of course, when traffic gets thin and competition sharp. The New York & New England has enforced its rules, however, through both dull seasons and busy, since April, 1888. If all the roads prove equally firm, each one of them can feel that it is a railroad after Judge Cooley's own heart. The New York, New Haven & Hartford is conspicuous by its absence from the list of signers to the circular.

Some Elements of Efficient Braking.

For various reasons, it is easier to find records of instances of train accidents from defective brake-power in English practice than in American. Ordinarily such instances become known here only accidentally and as matters of private information. In Great Britain, on the other hand, they are made known by the careful investigations and reports of the inspectors of the Board of Trade. The complete systems of signaling in use on the English roads make it possible to tell with much more certainty than it can usually be known in our

practice, whether or not the brakes were applied as early as they should have been, and whether the accident was not due to the negligence of the runner rather than to inefficiency of the brakes. But there is another reason for the fact that such instances are relatively more common in England than here. That is in the greater efficiency of our brake equipment in passenger service. This is one particular in which we may, without dispute, claim to lead the world.

At the end of 1888 only 65 per cent. of the vehicles running in passenger service in Great Britain were equipped with a continuous brake which filled the requirements of the Board of Trade inspectors. These numbered 34,500 vehicles, of which 19,837 were equipped with the automatic vacuum and 15,165 with the Westinghouse. There were 14,000 vehicles fitted with some continuous brake apparatus which partly complied with the Board of Trade requirements. Among these were 1,399 passenger cars and 6,336 horse boxes and other vehicles running in passenger trains, which were merely piped and had no brake gear. Other vehicles equipped to partly comply with the requirements were 7,327 with Smith's vacuum, 4,317 with vacuum and 1,617 with chain brakes.

Considering that but 65 per cent. of the passenger stock fulfills the very moderate requirements, which are merely such as every general manager or superintendent in the United States expects as a matter of course, it is not remarkable that every quarterly report of the Board of Trade inspectors should record accidents like the following, which appear in the report for the first quarter of 1889, and which were noted in these columns a few weeks ago. A passenger train with brakes on the tender and half the cars, coming into a station, ran into one just going out. A passenger train with but part of the wheels braked overran a danger signal and struck a freight train. Another passenger train of 13 vehicles had a continuous brake on but nine of them, and ran into the buffers at a station, injuring several people. Another, but partly equipped with continuous brakes ran into an empty train at the foot of a grade. There were still other accidents of the same sort.

Notwithstanding the facts that passenger stock in the United States is, almost without exception, uniformly equipped with the most efficient continuous brake in the world, and that the practice of running in passenger trains cars that are only piped, and without brakes, is almost unknown, yet we know that it is due partly to luck and partly to incomplete reporting that accidents from insufficient brake power are so seldom recorded here. The train, a diagram of which is shown on page 567, was a good example of a class which is common. With less than 74 per cent. of the brake power which he might have had and ought to have had at command, the engineer was able to handle the train well enough when the conditions were all favorable. He began to get the speed under control at a sufficient distance from the places where his regular stops were to be made, and so long as no emergency arose he had no trouble. But one day it happened that he found himself going down a grade of about one per cent., with a slippery rail, and an unexpected stop to make, and there was a collision. Had the locomotive been fitted with driver brakes and all the wheels of the six-wheeled trucks been braked, the braking power at his command would have been increased 35 per cent. Whether or not this would have prevented the collision cannot be said with certainty, but probably it would, for the speed was much reduced by the brakes as they were.

This accident happened to come under investigation, and so its real cause is known. Others of the same sort come to light occasionally, and we oftener hear of hair-breadth escapes from accidents like that which we noted a few months ago of a "limited" vestibuled train which got an unexpected signal while going 50 miles an hour, and ran 2,000 ft. on a level before it could be stopped. Here was a heavy, fast train of the very first class. There were unusual reasons why it should have been equipped to develop the highest possible brake power. Such reasons were found, not only in its weight and speed, but in the fact that it was competing in the highest class of passenger service, and had been fitted up regardless of expense; yet the twelve-wheeled cars of which the train was almost entirely composed were braked on but eight wheels. Probably the brake gear was of but moderate efficiency, and not up to the latest and best standards. The result of these defects was that actually one of the finest and fastest passenger trains made an emergency stop that would have been discredit to an air-braked freight train. Such instances, similar in kind but different in degree, must come within the common experience of many railroad officers, yet the fundamental principle that there should be a brake shoe for every wheel in a

train (except, perhaps, the engine trucks) is often neglected. The application of brakes to all the wheels of the six-wheeled trucks of the heaviest coaches has barely begun. The driver brake is, it is true, much more common, but even on good roads one may see suburban trains of three or four cars, which must get up speed quickly and run fast between stations, hauled by heavy engines without driver brakes. To run such trains where traffic is thick and signals are scarce requires a good deal of hardihood, for whatever may be the opinion as to the practicability and efficiency of the six-wheeled truck brake, there need be no doubt as to the driver brake. It is claimed by some of those who have looked into the problem of the application of brakes to six-wheeled trucks that, owing to the disadvantageous arrangement of the brake gear, the efficiency of the brakes cannot be increased directly in proportion to the number of wheels braked and, that hence the diagram on page 567 is somewhat misleading. However this may be, there is no doubt that the braking power can be materially increased by thus using a greater part of the weight of the car; and we would suggest to those state railroad commissioners who investigate accidents that they cannot do better than to inquire into the actual and the possible braking power of such trains as come to grief from not stopping quickly enough.

Guarding the Track.

We chronicle the July train accidents in this issue, and once more have to report a large number of people killed, one-fourth of whom were victims of the awful wreck at Thaxton's, Va., July 2. As this disaster resulted from causes that are very difficult to deal with, it deserves more than passing notice, and we print in another column a paper on one phase of the question from the pen of an operating officer, whose experience is wide and whose reputation for carefulness and good judgment is high.

It seems quite likely that this accident was one that could not have been prevented by any ordinary means, and it is possible that no inspection made in the night would have discovered the weakness in the embankment. Railroad Commissioner Hill, of Virginia, said at the time:

I am of opinion that a water-spout or some such heavy fall of water caused the washouts. There were three of them. The one which caused the wreck of the train was 75 ft. long and 25 ft. deep. It was $\frac{3}{4}$ mile west of Thaxton's. The largest one was one mile east of that, and was 200 ft. long and 60 ft. deep. Had the train passed the first one, it would have met the next, but the result could not have been any worse. It is impossible for any one to say whether the train was on the embankment when it went down, or whether the washout had occurred before the train reached it. A roadmaster was on the engine looking out for water. He was killed. Division Superintendent Cassell was in the baggage car. The door was open, and he was looking out at the time of the accident. That portion of the embankment had been used 34 years, had stood many rains, and there was no reason to believe it at all dangerous.

The train, although ordered to run cautiously, was probably making pretty good time, for it is said that the engineer was using steam, and did not shut off, the place being a hollow where speed had to be got up for an ascending grade; but there is no certainty that anything wrong would have been discernible from the cab if the speed had been even as low as three miles an hour. Where there is a suspicion that an embankment is undermined below the surface of the water, the only possible way in which a passenger train can be run over it safely in the night is to push a string of very heavily loaded freight cars ahead of the engine; and even then the speed would have to be very slow, not to mention the other impracticable phases of the problem. Manifestly a train might better be laid up at a station until daylight. That there are dangers in train-running which no practicable vigilance can provide against is vividly shown in the occurrence reported in these columns two weeks ago, where a trestle was weakened by a flood just as a passenger train reached it and only three minutes after the track inspector had passed the place, the train escaping only because it had an old, light locomotive, and by reason of the track being new and in extra good condition.

But while the Thaxton's disaster may be classed as unavoidable, and the victims as sacrifices to the necessities of the great public who must travel rapidly, and at night and over narrow embankments, it cannot be said that the importance of guarding the track is any less pressing. We said that probably no ordinary means would have discovered this gap. But it remains true that with a good system of track inspection the chances are largely in favor of the discovery of washouts and other sudden dangers before a train comes upon them. The chances of a patrolman's finding a break are in the proportion that the time since the last train bears to the time before the next one; and it is of course practicable to make this proportion very large. If a man goes over the road at all, he will naturally be

sent as closely in advance of trains as his trips can be arranged. Of the general necessity of patrolling tracks we need not argue. Cattle on the track, land slides, washouts, cars blown out of side tracks, train wreckers and other causes of trouble must be very familiar to those who follow our accident record from month to month. Add to these the unsuccessful attempts at train wrecking which occur every week, or oftener, and though not very costly in a direct way, are sure to give passengers much uneasiness, and it is plain enough that none but a very dull superintendent would go without track watchmen if he had the money to hire them with.

The points brought out by the writer of the article referred to are worthy of careful attention. That a man of judgment should be appointed to a place of this kind ought to go without saying; and yet the number of men allotted to each section master is now so small on many roads and the pay so inadequate to the securing of good men who will stick to the work that the problem is made very difficult at the outset. That a track walker should understand that office to be his first duty and that he should not have his mind too much distracted by other work should also be very plain. The ease with which a dangerous lapse can be made at this point was illustrated in the derailment, by a landslide in a cut, of an important passenger train on another road about the time of the Thaxton's disaster, where it was said that "a track watchman was supposed to be on duty, but it appears that he was not on hand at the time and the place needed." Not long ago two track walkers on a Virginia road fell asleep on the track and were killed! It was said that their hours of duty were 24 per day. The danger of fire is constant in dry weather and is a source of anxiety to many superintendents, although there have been no reports thus far this summer of any very bad accidents from this cause. Chatsworth, however, is not yet far enough distant to be forgotten. It is true that not only fires but various other kinds of obstructions to the safe passage of trains are often discovered in the nick of time by chance passers, and there are many instances where roads that could afford a good force of patrolmen have been indebted to this circumstance for immunity from serious disaster.

The use of velocipede hand cars is a question which ought to receive more attention than it does. Other superintendents agree with our correspondent as to the value of this machine, and 100 miles of road can be equipped with it very cheaply. With sections of ordinary length \$1,000 will cover the first cost. Running at 10 miles an hour, a 5-mile section can be inspected within about half an hour previous to the passage of each passenger train on the average road. It is of course necessary to smooth working that very good discipline be maintained. Cars must be handled by men who will not endanger their own lives or the property of the company by occupying the track carelessly in the face of trains, and there must be strict supervision to see that cars are not used recklessly by unauthorized persons or others.

The education of trainmen into using "good judgment" is an exceedingly difficult point. It is often hard to decide what the dictates of good judgment are in a given case. As we have seen, it is often necessary, to insure a safe passage, to reduce the speed practically to the pace a man would walk; and to get engineers to run at such a slow rate when they have a hundred impatient passengers is a matter which cannot be turned off by a general rule. To run "under control" is altogether too indefinite a term. To have good judgment on the engines it is essential to have a first-class article of the kind in the superintendent's office, and to keep the stock constant. The superintendent should have enough complete or partial copies of himself to enable him to make his office continuously accessible, day and night. By thus giving close attention to the handling of trains during storms and droughts he will come to more quickly discern the occasions where the giving of a general caution order to the runners is not sufficient, and where a special trip by a patrolman is the only safe expedient.

Doubtless the traffic departments would be inclined to complain loudly at the closing sentences of our correspondent's article if they had to be put in force; but does not every general manager know that they are not only characterized by wisdom, but by justice as well?

July Accidents.

Our record of train accidents in July, given in this number, includes 72 collisions, 68 derailments and 3 other accidents; a total of 143 accidents, in which 39 persons were killed and 147 injured. The comparison with the same month of previous years, given below, shows favorably in the total of persons killed, but in passengers alone the reduction is not so encouraging.

These accidents are classified as follows:

COLLISIONS:	
Rear.....	36
Butting.....	28
Crossing and miscellaneous.....	8
DERAILMENTS:	
Loose or spread rail.....	3
Broken bridge or trestle.....	3
Defective switch.....	1
Broken wheel.....	3
Broken axle.....	4
Defective truck.....	2
Fall of brake beam.....	1
Misplaced switch.....	8
Rail out for repairs.....	2
Badly loaded car.....	1
Cattle on track.....	1
Washout.....	5
Landslide.....	2
Malicious obstruction.....	3
Wind.....	1
Unexplained.....	28
OTHER ACCIDENTS:	
Boiler explosion.....	1
Broken axle.....	1
Broken truck.....	1
Total number of accidents.....	
143	

The causes of collisions, where given, were as follows:

	Rear.	Butting.	Crossing etc.	Total.
Trains breaking in two.....	5	1	1	6
Misplaced switch.....	1	3	1	5
Failure to give or observe signal.....	2	3	1	5
Mistake in giving or understanding orders.....	10	5	1	16
Miscellaneous.....	10	1	1	12
Unexplained.....	18	12	7	37
Total.....	36	28	8	72

A general classification shows:

	Col- lisions.	Derail- ments.	Other.	Total.	P. c.
Defects of road.....	7	7	7	21	5
Defects of equipment.....	6	10	3	19	13
Negligence in operating.....	26	11	1	38	26
Unforeseen obstructions.....	3	12	1	16	11
Unexplained.....	37	28	6	71	45
Total.....	72	68	3	143	100

The number of trains involved is as follows:

	Col- lisions.	Derail- ments.	Other.	Total.	P. c.
Passenger.....	33	27	2	62	32
Freight and other.....	39	41	1	81	68
Total.....	124	68	3	195	100

The casualties may be divided as follows:

	Col- lisions.	Derail- ments.	Other.	Total.	P. c.
KILLED.					
Employees.....	11	13	2	26	74
Passengers.....	2	5	1	8	18
Others.....	2	1	1	4	8
Total.....	15	19	4	38	100
INJURED.					
Employees.....	41	32	1	74	50
Passengers.....	16	54	1	71	47
Others.....	1	3	1	5	3
Total.....	58	89	3	150	100

The casualties to passengers and employees, when divided according to the classes of causes, appear as follows:

	Pass. killed.	Pass. injured.	Emp. killed.	Emp. injured.
Defects of road.....	1	4	3	1
Defects of equipment.....	1	7	3	1
Negligence in operating.....	13	13	14	43
Unforeseen obstructions and maliciousness.....	6	25	9	14
Unexplained.....	21	3	3	11
Total.....	42	72	23	70

Twenty-three accidents caused the death of one or more persons each, and 29 caused injury but not death, leaving 91 (64 per cent. of the whole) which caused no personal injury worthy of record.

The comparison with July, 1888 and 1887, shows:

	1889.	1888.	1887.
Rear collisions.....	36	29	26
Butting.....	28	27	33
Crossing and other collisions.....	8	5	2
Derailments.....	68	86	53
Other accidents.....	3	10	3
Total.....	143	157	117
Employees killed.....	26	48	49
Others.....	10	12	17
Employees injured.....	74	92	104
Others.....	74	77	167
Passenger trains involved.....	62	63	54

Average per day:

Accidents.....	4.61	5.06	3.77
Killed.....	1.26	1.93	2.13
Injured.....	4.74	5.45	8.74

Average per accident:

Killed.....	0.273	0.382	0.509
Injured.....	1.028	1.077	2.317

The worst accident of the month, that at Thaxton's, Va., is discussed in another column. The number of people killed was probably larger than our figures show. The coroner's jury exonerated the road. It appears that the foolish notion that reporters should be kept away from the scene of bad accidents led some one into a heartless blunder in this case. Railroad Commissioner Hill characterized the conduct of the officers in refusing reporters passage on a special train as "idiotic." Giving a correct report to the public is an important duty in such cases, and it will pay not only to afford proper facilities to a reasonable number of reporters, but to appoint some one to assist them in getting accurate information. It is to be remembered that when a whole passenger train is wrecked people demand details, even if the number of casualties is not great; and this demand cannot be regarded as unreasonable.

There are an unusual number of collisions from runaway cars this month, and not all of them are to be attributable to direct negligence, at least not on the basis of the reports as published. In the Shamokin case, the 17th, two passengers were killed. The small boy who loosens brakes is one of the most dangerous annoyances around a railroad, and one that nothing but vigorous measures will suppress. In this case it appears that safety necessitated not only the use of a derailing switch, but also that it be locked with a lock that no ordinary pounding could break. Near Tylersburg, Pa., a car broke

loose from a train, and ran a mile down a very steep grade and around some sharp curves, and killed two cows on the journey, and yet brought up all right on a siding at the foot of the hill. The injury of a dozen passengers by a derailment at Mount Carmel, Ill., the 17th, seems to have been owing to the presence of a freight car in a passenger train. The running of perishable freight in passenger trains is now so common that freight cars with wheels and running gear not quite up to the passenger train standard are likely to creep in unawares if close care is not given to the matter.

The only excuse for the collision at Ogleton, O., is that "the engineer forgot." If there is any virtue in the rule requiring both conductor and engineer to look out for the safety of trains, it would seem that it ought to be applied to empty engines. There should either be a conductor with every engine, or else the fireman's intelligence should be developed to a point where it could be made use of.

At Saybrook, Ill., the 21st, a wagon was struck by a hand-car propelled by four section men, and one of the latter and the driver of the wagon were killed. One of the train-wreckers, who tampered with a switch at Lebanon Junction, Or., on the 28th, divulged the facts of the crime while under the influence of chloroform the next day for the purpose of having a dislocated arm set, and three arrests were made. The ditching of a passenger train on the Mexican Central, near Chihuahua, July 10, killed three persons and injured a number.

The sensible and suggestive paper on the necessity of care in examining engineers, firemen and other railroad employees for deafness, which was read by Dr. Robert Barclay, of St. Louis, at the annual meeting of the National Association of Railway Surgeons in that city last May, is printed in the July number of the *Journal* of that Association, which is published at Fort Wayne, Ind. Dr. Barclay is consulting aural surgeon of the Missouri Pacific and the Missouri, Kansas & Texas, and has had much experience in testing men for deafness and in general examination of aural cases of various degrees of seriousness. He makes an earnest plea to his brother surgeons to impress the importance of this subject upon superintendents as well as upon employees, telling them of the danger to themselves and others of engaging in work where acuteness of hearing is essential, without being certain that their auditory faculty is in the best condition. Dr. Barclay found in one year 8 engineers, 7 firemen, 11 other trainmen and 16 stationmen, whose deafness interfered with the proper performance of their duties and caused them more or less anxiety, besides a large number in the machine shops. He quotes records of some curious cases, several of them from a medical work by Dr. Samuel Sexton, of New York city. Doctor Sexton tells of an engineer on the Amboy division of the Pennsylvania who was overcome by the prolonged and intense sound of the whistle. He blew his whistle for a road crossing, and the valve, getting out of order, refused to close. The whistle continued blowing until the train stopped at the station. The man was so near the source of the sound that he became dizzy, and it was necessary to lift him from his engine and assign another man to his place. Others around the train were affected disagreeably, but none so severely. The man recovered in a short time from the shock to his nerves. In another case, while an engine was running at high speed, the steam pipe of the whistle was torn away inside the cab, and the leak could not be closed. This caused such a tremendous noise that the engine had to be changed. The engineer's hearing was diminished for a fortnight, with excessive tinnitus. The case was cured spontaneously and gradually. The *Journal de l'Aisne* reports an occurrence on a French road in October, 1880, which it characterizes as "perhaps without precedent" in railroad history: Thursday evening the 8:20 train, which brings passengers leaving Paris at 5:30, entered the station of Provins, where it was awaited as usual by about fifty people. The chief of the station, the employees and others who were about opened their eyes in astonishment. The engineman and fireman alone continued their progress with the tranquility which comes from a duty done. It was only when the locomotive had stopped that they began to see and understand the astonishment of the spectators. The locomotive, the tender and a baggage-car alone had come from Longueville. In making up, the employees had simply forgotten to couple the rest of the train. This happened at night, and the doctors conclude that both runner and fireman were probably so far defective in hearing that they did not know that the peculiar noise made by a train behind them had ceased. We should say that their auditory nerves were no worse than their bump of general gumption, unless the journey that they made with only part of the train was a very short one, and made under exceptional circumstances. In another case an engineer was injured by an empty bottle thrown from a passing train, and the surgeon, on examining him, found that his hearing had been defective for some time previous, and that the engineer "had no idea that such a state of things existed."

The time of transit between New York and Liverpool has been again decreased by that most successful steamship, the "City of Paris." Her last voyage westward occupied 5 days 19 hours and 18 minutes, from Fastnet Light to Sandy Hook, this time being 3 hours and 45 minutes shorter than all previous records. There was great enthusiasm on board when it became known that the course to be traversed was about 100 miles shorter than that usually taken, it being nearly that of a great circle of the earth, and, therefore, nearly the shortest possible. The passengers were greatly interested in the selling of pools on the ship's run, and as high as 180 shillings was paid for 510 miles and over.

Near the end of the journey, when it became evident that the vessel was to surely outdo all previous runs, the passengers presented Captain Watkins with a written expression of their congratulations on his success, the signatures to which made a double column of names over 6 ft. long. In noting this fastest trip across the Atlantic it is well to remember that it has been made under the most favorable conditions; the weather was practically perfect, the sea smoother than can ever be expected, and the course traversed shorter than it is generally considered safe to follow when the weather is threatening from the southward. The machinery worked during the whole passage without failure or stoppage, and an inspection of the engine room and fire room showed that it was doing almost if not quite its best, and at times the revolutions of the engines were as high as 90 turns per minute; and, further, a representative of the builder was on board superintending the running of the engines. Therefore, it is well to remember that, although this fast trip was made without the least apparent difficulty, yet the conditions were so favorable that we must not expect that the average time between New York and Queenstown will be quite as small as that of this trip either for "the City of Paris" or other steamers now running.

"Her face is her fortune" may be truly said of many a woman, and it is even admitted that many of the sterner sex increase their worldly possessions by their "cheek," though to refined natures the thought is so sordid that it finds no place in poetry. To give substance to the first-mentioned expression there must be more or less of sentiment in the observer. But the business of a soulless railroad corporation is supposed to be the most utterly devoid of sentiment of anything imaginable, and we are therefore somewhat surprised to learn that the agents of a certain Western road have been authorized to sell half-fare tickets to Sisters of Charity, the same as to clergymen, but without credentials. It is said that as it is impracticable for all the Sisters to be supplied with permits, the half tickets are to be sold to all women dressed in the habit of the order who may apply for the rate, such tickets to have written across their face the word "Sisters." The applicant's face (with its "environment") is her credential. It seems to be assumed that ticket-sellers will be sufficiently wise in detecting the wiles of the daughters of Eve not to be imposed upon by women who put on the garb of a Sister of Charity in order to secure the half rate when they have no right to either the "black clove" or to the reduced rate.

Verily, great must be the confidence of the Western traffic manager in the certainty that the Western girl will never neglect her "make up" for the sake of saving a dollar. When we see fashionable mourning suits worn out of respect for imaginary deceased great-uncles, because the fair wearers believe that these garments suit their forms and complexions, it must be said that the revenues of this Western road are dangerously near to being trifled with. A railroad ticket is not a fortune, but experience teaches that the owners of many faces will subject them to great metamorphoses for the sake of a getting ticket without paying for it.

For a month or two past the Baltimore & Ohio has been experimenting with the use of coke as a fuel for locomotive engines on express trains. The engines used for coke burning have 19-in. x 24-in. cylinders, and fire-box 9 ft. long provided with ordinary cast-iron, rocking, straight bar grates. In burning coke the only alterations found necessary were making the spaces wider between the grate bars than for coal to admit as much air as possible, removing the brick arch and using an exhaust nozzle which could be varied in size to suit the state of the fire. Three engines are now burning coke successfully, making running time on some of the fastest passenger trains between Philadelphia, Baltimore and Washington with much less flying dust and dirt, and greater cleanliness and comfort to passengers.

New York will have to be alert and active if she wants the World's Fair in 1892. The Chicago movement is not all air by any means. The railroad men of that part of the country are taking a hand in, and they are very wide awake indeed. We do not see that the influence of the railroad men in the East is much felt in the deliberations of the sages who are conducting the affair here. It will never do to rely upon New York's size and wealth and geographical position to secure the exhibition. A little more energy and enthusiasm will have to be put into the work, or the railroads of the East will have to be contented with a long haul instead of a big volume of traffic.

NEW PUBLICATIONS.

Journal of Association of Engineering Societies, August, 1889.

This issue of the *Journal* contains papers on Steam Plants for Electric Service, by William H. Bryan; on Heating and Ventilating School Rooms, by N. B. Wood, with discussion by members of the Civil Engineers' Club of Cleveland; a Memoir of Edward Southwick Philbrick, by a committee of the Boston Society of Civil Engineers; a System of Marking Patterns, by A. J. Firth, and a Proposed Construction of a Railroad Embankment to be Submerged, by Lawson B. Bidwell. The usual index to current literature is also included.

The railroad articles in *Scribner's Magazine* came to an end with the paper in the September number, which is on "Safety in Railroad Travel," by H. G. Prout. The author recognizes that in the limits set for him he could not treat at much length all of the mechanical devices which contribute to safety in railroad working, and, therefore, confines him-

self pretty closely to brakes and signals as by far the most important of all such devices. Various other matters, such as switches, couplers, heating and lighting, are briefly mentioned. The paper is written for the general reader, and the technical reader will probably not find much in it that is new to him, but he may find some interest in the restatement of familiar facts. Doubtless many, even among railroad men, will find the portion which treats of interlocking of particular interest, for this is a subject with which they are much less familiar than they are with the air brake. The paper is quite profusely illustrated, some of the pictures being very good and a few not so good. The frontispiece cannot be included among the very good pictures. It may be effective from the artist's standpoint, but it gives a novel idea of some of the details and proportions of a locomotive and tender. It is announced that the articles which have appeared in this series will shortly be published in a book under the title of "The American Railway."

TRADE CATALOGUES.

A Visit; being a Colloquial Description of the Sherwin-Williams Co.'s Paint and Color Manufactory, located at Cleveland, O.

This is a trade publication of a very novel and attractive sort. The style and scope of it are suggested by the title. It is a running description of the works of the company, put into the form of a dialogue between various officers and certain visitors. The visitors are Mr. Van D. Brown, dealer in paints; Mr. Z. White master painter; Mr. F. C. Green, capitalist, and Mr. Fr. Gray, a salesman. In the course of a long but pretty well sustained conversation the manager of the works contrives to insert considerable information into the minds of his visitors. The little book is illustrated by many pen and ink drawings and direct reproductions of photographs, and is beautifully printed.

TECHNICAL.

Locomotive Building.

The Richmond, Nicholasville, Irvine & Beattyville road last week ordered from the Pittsburgh Locomotive Works its first engine, and from the Pullman Car Co. a construction train of 10 cars.

The first locomotive for the Cape Breton railroad was landed at Sydney, C. B., last week.

The Rhode Island Locomotive Works have just completed a new passenger engine for the New York & New England. It has cylinders 20 x 24 and 69 in. drivers. It was designed by J. B. Henney, Superintendent of Motive Power.

The Louisville, New Orleans & Texas has received 10 of the 15 locomotives recently ordered of the Schenectady Locomotive Works. Ten are for freight service and five for switching.

The Receiver of the Houston & Texas Central has been authorized to purchase 11 new freight engines. They are not to cost exceeding \$7,500 each.

The Rogers Locomotive Works, of Paterson, N. J., have received a contract to build 6 locomotives for the Sioux City & Northern.

Car Notes.

The Grand Trunk shops at London, Ont., have just turned out a handsome new dining car 63 ft. long, with vestibules. The interior is finished in mahogany and ornamented in blue and gold. The tables on one side of the aisle seat four persons each and those on the other side two. In place of the usual seats, rattan chairs are provided.

The Pennsylvania has let the contracts for building the 3,000 freight cars for the lines west of Pittsburgh, as follows: 2,000 box cars equally divided between Pullman's Palace Car Co., Ohio Falls Car Co., Michigan Car Co. and Lafayette Car Works. The rest were long, drop-bottom gondolas, and were let as follows: Pullman Palace Car Co., 500; Michigan Car Co., 250; United States Rolling Stock Company, 250.

The Georgia Pacific is having a number of freight cars of 60,000 lbs. capacity built at the Pullman Car Works at Chicago. The cars are equipped with Wagner doors and Janney couplers, and they have no dead blocks. The Pullman shops of the Pullman Co. now have orders for 1,000 cars. The works will soon start on an order of 200 Armour refrigerator cars and 200 Wickes refrigerator cars for the Merchants' Dispatch, and the 500 box cars for the Pennsylvania Co. The passenger car shops are busy constructing cars for the Norfolk & Carolina, the Georgia Pacific, Richmond & Danville, Oregon Railway & Navigation Co. and others.

A Pittsburgh iron company has received the contract for the construction of 75 steel oil tank cars, to be used for the transportation of oil between Pittsburgh and the Pacific Coast. The contract calls for the delivery of all the cars at San Diego, Cal., by Jan. 1.

The Easton shops of the Lehigh Valley have received orders for 12 chair-cars and the same number of passenger cars.

The Birmingham Railway Supply Co. has closed a contract with the Birmingham, Powderly & Bessemer Railroad, to furnish it with five passenger cars.

An order has been placed for 500 freight cars for the St. Louis, Iron Mountain & Southern.

The Lake Erie & Western will soon place an order for 500 box cars of 50,000 lbs. capacity.

It is stated that the Cleveland, Cincinnati, Chicago & St. Louis will order 500 freight cars at once.

The Haskell & Barker Car Co., of Michigan City, Ind., has received a contract for 100 stock, 100 platform and 100 box cars for the Sioux City & Northern.

Bridge Notes.

Bids are asked until Sept. 17, by the County Court, at Laredo Tex., for building an iron bridge 345 ft. long.

The contract for an iron bridge over Munn's brook, at Westfield, Mass., has been awarded to R. F. Hawkins & Co., of Springfield, at \$1,585.

The Smithfield bridge or viaduct over the Monongahela river, in Pittsburgh, is to be enlarged by an addition of 22 ft., for cable traction purposes, at a cost of \$200,000. The contracting engineer is Gustav Lindenthal.

The following proposals for a Pratt truss highway bridge of 100 ft. span at Middleway, W. Va., have been received by T. G. Baylor, C. E., Charlestown, W. Va.; Smith Bridge Co., Toledo, O., \$1,795, 6 panels; King Iron Bridge

& Mfg. Co., Cleveland, O., \$1,850, 7 panels; Wrought Iron Bridge Co., Canton, O., \$1,875, 7 panels; Penn Bridge Co., Beaver Falls, Pa., \$1,950. The contract was awarded to the King Iron Bridge & Mfg. Co.

The contract for a suspension bridge of 175 ft. span, at Anderson, Ind., has been let to the Indiana Bridge Co., of Muncie, Ind.

The contract for an iron bridge at South Haven, Mich., has been awarded to the Smith Bridge Co., of Toledo, O., at \$9,300.

The contract for a double roadway bridge at Adams St., Chicago, Ill., has been awarded to the King Iron Bridge & Mfg. Co., of Cleveland, O. Riter & Conley, of Pittsburgh, Pa., have the contract for a new iron bridge at Madison St. The contracts for masonry have been awarded to Fitzsimmons & Connel, of Chicago.

The Chicago Forge & Bolt Co. has the contract for six steel bridges between Granbury and Stephenville, Tex., on the Fort Worth & Rio Grande, Pratt trusses, one of 130 ft. span, one of 110 ft., two of 90 ft.; one lattice girder of 75 ft. and one plate girder of 60 ft. span. They are supported on iron cylindrical piles filled with concrete.

The following proposals for the superstructures of viaduct and bridges have been received by the Hamilton County Commissioners for bridges over the Cincinnati, Washington & Baltimore, and Cincinnati, Hamilton & Dayton roads and over Mill Creek; also for a viaduct connecting those over the valley between Garrard and State avenues, on the line of Liberty street, all in Cincinnati: Smith Bridge Co., Toledo, O., \$65,700; Milwaukee Bridge Co., \$69,217; Youngstown Bridge Co., Youngstown, O., \$70,240; Queen City Bridge Co., Cincinnati, \$72,206; King Iron Bridge & Manufacturing Co., Cleveland, O., \$73,480; F. J. P. Brackett Bridge Co., Cincinnati, \$74,920; Variety Bridge Co., Cleveland, O., \$76,595.90; Columbus Bridge Co., Columbus, O., \$77,863; Keystone Bridge Co., Pittsburgh, Pa., \$79,645.

The contract for constructing the viaduct over the tracks of the Missouri, Kansas & Texas, at Austin, Tex., has been awarded to Wood & Bradburn. The cost will be about \$24,000.

The contract has been let for building iron bridges across Elm and across Clear Creek at Gainesville, Tex.

J. C. Norton, Dalton, Ga., will receive bids until Sept. 16 for constructing a bridge over the Conasauga River at Zant's Ford, and for a bridge over same river at Upper King's bridge.

The Richmond, Nicholasville, Irvine & Beattyville road has awarded the contract for an iron and steel bridge across Casey Creek, near Nicholasville, Ky., 1,600 ft. long, to the Shiffler Bridge Co., of Pittsburgh, Pa., the price being \$100,000. The road will shortly build a similar structure across the Kentucky River, at Irvine, Ky., to cost \$100,000, and bids will soon be asked for. A. E. Richards, Louisville, Ky., is President.

The contract for building the iron bridge across the Ganauque River, Ont., near the Grand Trunk station, has been awarded to Rousseau & Mather, of Montreal. Their bid was \$3,075 for the iron work and \$3,335 for masonry and approaches.

At Frederickton, N. B., last week the announcement was made that the bridge building firm of Simmons & Burpee had assigned.

The Quebec government engineer will soon inspect the Galineau River and choose a site for the construction of the proposed bridge, which is to connect Hull with Galineau Point, Que.

Manufacturing and Business.

A. L. Ide & Son, of Springfield, Ill., have received a contract from the city of Chicago for furnishing and erecting engines, boilers and machinery complete for four electric light stations for lighting the streets. Sixteen "Ideal" engines of 125 h. p. each will be required.

Greenlee Bros. & Co., Chicago, manufacturers of wood-working machinery, have just completed a new four-story and basement brick building and finished putting the machinery in place. The building occupies Nos. 227, 229 and 231 West Twelfth street. The frontage on Twelfth street is 75 ft., extending back 127 ft. to an alley 20 ft. wide, on which their foundry fronts. The boilers, engine room and blacksmith shop are in the rear part of the basement. The power is furnished by two new boilers of 125 h. p. each, and a new Hamilton-Corliss engine of 200 h. p. On the first floor are the offices, 25 x 80 ft., finished in oak and cherry. The balance of the space is used as a salesroom. The iron-working machinery is on the second floor, and the wood-working machinery and pattern-shop on the third floor.

Judgments for \$58,516 have been entered against Comegys & Lewis, contractors, at No. 15 Cortlandt street, New York City, in favor of the following creditors: Schickel Harrison Howard Iron Co., of St. Louis, \$26,635; Wing & Evans, \$15,635; Coffin & Stanton, \$11,955; Thomson-Houston Electric Co., \$3,128; Penn Iron Co., \$1,163. Messrs. Comegys & Lewis have been in business for about 10 years, principally as water-works contractors. In explanation of the judgments the representatives of the firm said that they were taken with a view of settling up the partnership of Comegys & Lewis. The firm would be dissolved, and Mr. Comegys would continue the water-work business on his own account. Mr. Lewis is in Chili.

Mr. Jas. T. Leighton has been appointed New York agent for the Consolidated Car Heating Co., with office at 15 Cortlandt street.

A certificate of incorporation has been filed in New York by the Railroad Brake, Switch, Signal & Safety Gate Co., for the purpose of manufacturing railroad switch, brake, signal and safety gate improvements. The capital stock is \$100,000. The company's office is to be New York City. George V. Hamm, John Hahn, Edmund M. Moffett, Amand Schleb-wried and A. Hamilton Reavey are the trustees.

The George F. Blake Mfg. Co., of Boston, has contracted with the city of Toronto to build two pumping engines of a capacity of three million gallons each per 24 hours. The engines will have the well-known Corliss valves. The power is to be furnished by two engines of the Brown type, with three steel tubular return flue boilers, each 5½ ft. in diameter by 15 ft. long. The cost of the plant is to be about \$30,000, and the work is to be done in the shops of the Polson Iron Works, Toronto.

Iron and Steel.

A dispatch says that the Pennsylvania Steel Company intends to establish a large shipyard, thoroughly equipped, for the construction of steel ships, at Sparrow Point, Md., 12 miles from Baltimore, where the company has recently completed large steel works. The company will erect additional foundries, sheet mills, rolling mills, cupola houses, etc. The cupola house, which is to be 169 ft. 6 in. long x 87 ft. wide, was begun a few days ago. The converter house will be 120 ft. x 140 x 50 ft., divided into three floors, but will have four cupolas for melting iron, and two 15-ton Bessemer converters for converting the iron pigs into steel ingots.

It was announced by a stockholder of the Centre Iron Co.'s Works, in Bellefonte, Pa., which were recently closed, that the works would not resume again, as they did not pay expenses. About 750 men will be thrown out of employment.

An experimental heat was made recently in the new Book-walter converter of the Chester Steel Casting Co.

The Pennsylvania Steel Co., of Steelton, Pa., has notified its employees of an increase of wages. The advance is from 2½ to 10 per cent., and restores the wages paid before the reduction, several months ago.

J. P. Witherow & Co., of Pittsburgh, have just completed and started in successful operation a Bessemer steel plant for the Chester Rolling Mills, at Thurlow, near Chester, Pa.

The sheet mill of the Reading Iron Co. resumed Aug. 21, with about 80 men. Next week the mill will begin to run on double turn, when about 275 men will be given employment. This is the first department of the Reading Iron Works to resume operations since the suspension. It had not been intended to start this mill until the rest resumed, but owing to some urgent orders the furnaces were lit.

A car for carrying blooms and billets to the rolls is in operation at the new 26-in. mill recently erected by Jones & Laughlins, which is likely to supersede the cumbersome tables now in use. The car has a flat chilled iron bed, and is operated from below by a cable.

The Monongahela Mfg. Co., of Monongahela, Pa., shipped a carload of castings last week to Paducah, Ky., for the blast furnace of the Paducah Iron Co. at that point.

William Tod & Co., of Youngstown, Ohio, will build the blowing engines for the new furnace of the Clifton Iron Co., at Ironaton, Ala.

The Spiral Weld Tube Co., of East Orange, N. J., has secured the contract for furnishing 60 miles of natural gas mains to the city of Toledo, O. Owing to other large contracts ahead and the short time allowed for delivery, the company has been obliged to sublet a part of the order to other firms.

The property of the Briarfield Coal & Iron Co. was sold Aug. 19, by order of the United States Court, for \$600,000. The trustees were the purchasers for the bondholders. The plant is situated in Bibb County, Ala., and consists of a furnace, a nail mill and 32,000 acres of coal and iron land.

The Columbus Iron Works Co., of Columbus, Ga., has increased the capital stock from \$100,000 to \$200,000.

The Keystone Furnace Co., of Reading, Pa., made an assignment Aug. 21 for the benefit of creditors. The property is mortgaged to nearly its full value, and there is a large floating debt. There is a mortgage of \$175,000 to the Reading Trust Co., and another of \$250,000 to George D. Stitzel and George W. Buckman, trustees. It is believed that it will fall into the hands of the Philadelphia & Reading, which is a large creditor, and become a part of the Reading Iron Company. The iron company owns about 13 acres of land in Reading, on which are erected two furnaces of a capacity of about 450 tons a week each. The company was organized in 1873. The furnace will continue in operation under the assignee for the present. About 70 men are employed.

Stevens, Hamilton & Co., machinists, Galt, Ontario, are erecting a new machine shop 60 x 30 ft., and other buildings.

Preparations are being made for the erection of extensive iron works at Three Rivers, Quebec, to give employment to 600 hands.

C. Huston & Son, proprietors of the Lukens Rolling Mills, at Coatesville, Pa., are erecting a plate mill to contain a three-high plate train. The top and bottom rolls are 120 x 34 in., and the intermediate one is 120 x 20 in., all chilled. The A. Garrison Foundry Co., of Pittsburgh, has the contract for the rolls, and Mackintosh, Hemphill & Co., Limited, also of that city, have the contract for the balance of the machinery, with the exception of the engine, which will be of the Corliss horizontal type, and will be built by Robt. Wetherill & Co., of Chester, Pa.

The contract to construct all the stations on the Louisville Southern extension from Lawrenceburg, Ky., to Lexington, Ky., has been awarded to R. C. Bradley, of Lawrenceburg, Ky. These are twelve in number.

Notes.

A passenger conductor of the Chicago, Milwaukee & St. Paul, in ejecting four men for non-payment of fare, at Wadsworth, Ill., one night last week, was resisted by one man, who tried to climb back upon the train. After being struck with the butt of a revolver, the conductor fired and killed the man.

On the Pacific express of the Pennsylvania, near Lancaster, Pa., on the night of Aug. 23, the porter of a Pullman sleeping car was shot twice in the attempt to overpower a man who was trying to rob passengers. The robber had just been released from state prison.

The investigation of errors in train orders has been closely attended to on the New York, Pennsylvania & Ohio of late, and it is stated that mistakes have been greatly reduced. A year ago they amounted to thirty or forty a month, all of them unimportant, consisting probably of the omission of "O. K." or some other inaccuracy. In June, 1889, of the 11,008 orders issued there were only seven containing errors; in the 3,319 orders issued on the western division not one error occurred.

Naval Affairs.

The Acting Secretary of the Navy last week opened proposals for constructing five steel cruisers, three of them to be of about 2,000 tons and two of 3,000 tons displacement. The Bath Iron Works, of Maine, proposed to build the three 2,000-ton vessels for \$780,000, but with the addition of six months to the advertised time (two years); Cramp & Son, of Philadelphia, proposed to build the same vessels at \$675,000 each, and the two 3,000-ton vessels at \$1,225,000 each. As the appropriation is limited by the act of Congress to \$700,000 each in the case of the 2,000-ton vessels, and \$1,100,000 for each of the 3,000-ton vessels, none of the bids can be accepted.

At the trial trip of the United States cruiser "Charleston" in San Francisco Bay last week, a speed of over 19 knots was attained, and more than the maximum horse power was developed, but after a run of 2½ hours the eccentric of the air pump of the forward engine slipped, interrupting the trial.

The contractor for building the new government drydocks at Norfolk, Va., and New York, has advised the Navy Department that the Norfolk dock will be in readiness to receive vessels on Sept. 19. The coffer dam was taken away Aug. 23. The gate which closes the dock is a fine piece of work and perfectly water-tight. Machinery of new and powerful design has been supplied at this dock. One of the pumps has a capacity of 47,000 gallons per minute, which is much in excess of the pumps at the Newport News dock.

The work on the New York dock is also progressing rapidly, and it is expected that it will be completed Nov. 1, or a half month in advance of the contract time.

The Restoration of the Pennsylvania.

The following is from a press dispatch of Aug. 23: Assistant Chief Engineer Richards, of the Pennsylvania Railroad, has just returned from the work of putting the road in good order between South Fork and Johnstown. He said: We have laid twenty miles of new rails and made a new road bed. The stone bridges which are now in course of construction, and which are to take the place of the wrecked iron bridges, will be finished by Nov. 1. They are to accommodate three tracks instead of two as before. These bridges are being erected by contractors, and for each day after November 1 they forfeit \$100. The iron bridges are nearly all replaced, and by Christmas the road, it is expected, will be in the best condition.

Rails for the Chignecto Ship Railroad.

Of the 7,000 tons of steel rails required for the Chignecto Railroad, 2,130 tons have arrived at Halifax and 39 carloads have been discharged at Amherst, N. S. The rails for the main line weigh 110 lbs. per yard, are 6½ in. high and 6 in. wide at the base. Six thousand four hundred tons of the rails are of these dimensions, the balance being 70 lbs. to the yard.

The Portelectric Company.

This company has secured a piece of land on the New York & New England at Dorchester, between Howard street station and Mount Bowdoin station, where an experimental track will be built. The contract for the superstructure has been let, and a survey made, and work will be commenced very soon. The structure when finished will have tangents, curves, grades, grades on curves, and switches. The helices will be about 6 ft. apart, and the carriage will be about 12 ft. long, with a circular section of about 12 in.

The Sharpneck Journal Bearing.

We have recently received from an officer of the Chicago, Rock Island & Pacific some information concerning the Sharpneck anti-friction journal bearing, which is somewhat more specific than anything which we have heretofore published. One first-class coach was equipped with this device, with cast-steel rollers, in May, 1888. It has been running successfully ever since, with the exception of a short interval last July, when the car was in the shops to be cleaned and varnished. That occasion offered an opportunity for the examination of the journal bearings. It was found that the diameter of the journals was not reduced more than 1/16 in., and that of the rollers not more than 1/32 in. This car runs on a local passenger train and makes 100 miles per day, except Sundays, and up to Aug. 23, 1889, had made about 38,000 miles. After it had been about 13 months in service permission was given to the patentee to equip a local train, consisting of one baggage car, one smoking car and two first-class passenger cars. The train runs 200 miles a day except Sundays, and is very fast, making a large number of stops, and the service is very hard on the running gear. This train was put in service July 3, 1889, and has been running regularly ever since, without giving any trouble. It had made, Aug. 23, 8,880 miles, or 44 trips, and an excursion of 80 miles to exhibit the device to a party of railroad men and others. On this excursion the train was run at a speed of over 60 miles an hour without any sign of heating. The statement which has been before made is repeated—that one man can easily push one of these cars back and forth on a level track.

THE SCRAP HEAP.

Lake Superior Iron Ore Trade.

The shipments of iron ore from Lake Superior up to the middle of this month were 3,896,372 gross tons, an increase of 75 per cent. over the same period of last year. The *Iron Trade Review* says "it looks very much as though the estimate made in the early season, of a probable output of 6,000,000 tons would have to be increased by at least 1,000,000. A canvas of the ore dealers shows that in almost every instance the production will exceed the original estimate in some instances by 50 per cent. The bulk of the ore, moreover, has been sold, and there are still a good many furnace men who having been caught napping last year, are looking for a surplus of their raw material to provide for an emergency. Some difficulty is beginning to be experienced, however, in securing vessels on account of the increasing demand for grain carriers, and unless there is a drop in ore shipments an advance in lake freights may be expected.

Detroit Union Depot.

The Fort Street Union Depot Co., with a capital stock of \$1,000,000, has filed articles of association in Michigan to build a depot near the City Hall in Detroit, to cost about \$500,000, for the Canadian Pacific, Flint & Pere Marquette and Wabash roads. W. W. Crago, of Boston; James F. Joy, of Detroit; George Coppel, of New York, are interested, and it is proposed to run the tracks from the present terminal of the Wabash to the heart of the city.

A Bigger Tower than Eiffel's.

According to the *Herald* there is a project on foot to build in London a tower 2,000 ft. high. Sir Edward Watkin is said to be the originator of the scheme.

Delirium Furiosum.

A curious protest was recently discovered among the archives of the Nuremberg Railway Co., at Furth. It was drawn up by the Royal College of Bavarian Doctors in 1835, and contains the following passage, pointing out the danger of the new system of travel:

"Travel in cars drawn by a locomotive ought to be forbidden, in the interest of public health. The rapid movement cannot fail to produce among the passengers the mental affection known as *delirium furiosum*. Even if travelers are willing to incur this risk, the government should at least protect the public. A single glance at a locomotive passing rapidly is sufficient to cause the same cerebral derangement; consequently it is absolutely necessary to build a fence 10 ft. in height, on each side of the railway."

Railroading in Colleges.

A circular received from Trinity College, N. C., announces that, beginning Jan. 1, 1890, a course of lectures will be given on railroads and railroad problems. The course will include two lectures a week for ten weeks. Parallel courses of reading in books and periodicals will be laid out to accompany the lectures.

General Railroad News.

MEETINGS AND ANNOUNCEMENTS.

Dividends.

Dividends on the capital stocks of railroad companies have been declared as follows: Buffalo & Southwestern, 1 per cent. on common stock, and 3 per cent. on preferred stock, payable Sept. 5.

Columbus, Springfield & Cincinnati, 1½ per cent., payable Sept. 2.
Chicago, Burlington & Quincy, quarterly, 1 per cent., payable Sept. 16.
Fort Wayne & Jackson, 2¼ per cent. on preferred stock, payable Sept. 2.
Illinois Central, 3 per cent., payable Sept. 3.
North Carolina, 3 per cent., payable Sept. 1.

Meetings.

Meetings of the stockholders of railroad companies will be held as follows:
Central Counties, special meeting, Ottawa, Can., Sept. 10.
Chatham, special meeting, Chatham, N. B., Sept. 2, to organize the company and elect officers.
Hereford, annual meeting, Cookshire, Que., Sept. 2.
Minneapolis, St. Paul & Sault Ste. Marie, annual meeting, Minneapolis, Minn., Sept. 17.
Nashville & West Nashville, special meeting, Nashville, Tenn., Oct. 9.
Ohio, Indiana & Western, annual meeting, Indianapolis, Ind., Sept. 11.
Ohio Southern, special meeting, Springfield, Ohio, Aug. 30.
Terminal Railroad Association of St. Louis, special meeting, St. Louis, Mo., Oct. 1.
Toledo & Ohio Central, annual meeting, Toledo, O., Sept. 2.
Yorkville Loop Line, annual meeting, Toronto, Ont., Sept. 10.

Railroad and Technical Conventions.

Meetings and conventions of railroad associations and technical societies will be held as follows:
The Roadmasters' Association of America will hold its seventh annual convention at Denver, Colo., Sept. 10.
The Master Car and Locomotive Painters' Association will hold its twentieth annual convention in Chicago Sept. 11. The headquarters are at the Tremont Hotel.
The American Association of General Passenger and Ticket Agents will hold its next semi-annual meeting in Atlanta, Ga., Sept. 17.
The New England Railroad Club meets at its rooms in the United States Hotel, Beach street, Boston, on the second Wednesday of each month, except June, July and August. The next meeting will be held Sept. 11.
The Western Railway Club holds regular meetings on the third Tuesday in each month, except June, July and August, at its rooms in the Phenix Building, Jackson street, Chicago, at 2 p. m.
The New York Railroad Club meets at its rooms, 113 Liberty street, New York City, at 7:30 p. m., on the third Thursday in each month.
The Central Railway Club meets at the Tift House, Buffalo, the fourth Wednesday of January, March, May, August and October.
The American Society of Civil Engineers holds its regular meeting on the first and third Wednesday in each month at the House of the Society, 127 East Twenty-third street, New York.
The Boston Society of Civil Engineers holds its regular meetings at its rooms in the Boston & Albany station, Boston, at 7:30 p. m., on the third Wednesday in each month.
The Western Society of Engineers holds its regular meetings at its hall, No. 67 Washington street, Chicago, at 7:30 p. m., on the first Tuesday in each month.
The Engineers' Club of St. Louis holds regular meetings in St. Louis on the first and third Wednesdays in each month.
The Engineers' Club of Philadelphia holds regular meetings at the house of the Club, 1,122 Gerard street, Philadelphia.
The Engineers' Society of Western Pennsylvania holds regular meetings on the third Tuesday in each month, at 7:30 p. m., at its rooms in the Penn Building, Pittsburgh, Pa.
The Engineers' Club of Cincinnati holds its regular meetings at the Club rooms, No. 24 West Fourth street, Cincinnati, at 8 p. m., on the fourth Thursday of each month.
The Engineers' Club of Kansas City meets at Kansas City, Mo., on the first Monday in each month.
The Civil Engineers' Society of St. Paul meets at St. Paul, Minn., on the first Monday in each month.
The Montana Society of Civil Engineers meets at Helena, Mont., at 7:30 p. m., on the third Saturday in each month.
The Civil Engineers' Club of Kansas holds regular meetings on the first Wednesday in each month at Wichita, Kan.

American Institute of Mining Engineers.

The fifty-fifth meeting of the Institute will be held at Ottawa, Ont., beginning on Tuesday evening, October 1, 1889. Dr. John Sweetland is the chairman of the local committee of arrangements; and the secretary, to whom all communications concerning the local arrangements, hotel accommodations, etc., should be addressed, is Mr. B. T. A. Bell, 14 Metcalfe street, Ottawa. Hotel headquarters will be at the Russell House. Special rates to members of the Institute, \$3 p. r. day. The Grand Union and the Windsor Hotels (rates at either, \$2 per day) are also recommended by the committee.

The following provisional programme is announced, subject to such additions or modifications of detail as may be found advisable hereafter:

Tuesday Evening.—Opening session. **Wednesday.**—Excursion by rail and river to the phosphate mines on the Lievres River. **Wednesday evening,** perhaps, a session. **Thursday and Friday.**—As many sessions as may be desirable for the reading and discussion of papers. Visits to points of interest in and around Ottawa, including the lumber mills, Chaudière Falls, Government House, Parliament buildings, Geological Survey Museum, etc., will be so arranged as not to interfere with the sessions.

The following excursions will be organized to take place after the close of the meeting, and to occupy several days of the following week. Members who can afford the time for either of these are requested to give notice which they will choose: a. Excursion to the Sudbury copper mines and the works of the Canada Copper Company, on the Canadian Pacific Railroad, with opportunity, to such as desire it, to continue their journey to the Port Arthur silver region, on the north shore of Lake Superior. b. Excursion by special trains through the Eastern Townships, visiting the asbestos mines at Weford and Coleraine, the Oxford copper mines, the Rockland slate quarries, the Capelton chemical works, etc., and terminating at Montreal or Quebec. Railroad and Pullman facilities on all excursions will be provided without expense to members.

Members and friends attending the meeting will be entitled to reduced rates on the "certificate" plan.

Engineers' Club of Kansas City.

The following is the programme for the fall of 1889:

Sept. 7—The Early Manufacture of Iron, by H. A. Keefer; Water Gas, by A. G. Glasgow.
Oct. 7—Some Tests and Observations on Building Stones, by J. A. L. Waddell and W. D. Jenkins.
Nov. 4—General discussion on Sewerage Systems.
Dec. 2—Snow Plows, by F. E. Sickles.
Dec. 4—Annual meeting; reports of officers and committees; nomination of officers for 1890.

New England Roadmasters' Association.

In our last issue were published certain reports presented at the Seventh Annual Convention of this body. The report of the convention is here continued.

Mr. W. F. Ellis, Secretary and Treasurer, read a description of a device used on the Lehigh Valley road for locking switches, and the following resolution was adopted: It is recommended to all members to try any device which shows merit, which will convict any employé of leaving a switch wrong, or which will prevent cars from going on to the main track to wreck trains and will derail said cars before obstructing main track.

The Committee on Fencing reported as follows: Where stone is plenty and convenient to the location there is no question but what a stone wall is the cheapest and best kind of fence that can be built, as it neither burns down nor rots out; in fact it is "there to stay," and needs very little care compared to other kinds of fencing. In locations where stone is not to be obtained, a barbed wire fence is recommended, of not less than 4 wires, 4 ft. high, fastened to posts not more than 10 ft. apart by 2-in. staples. While recommending the wire fence for general use, your committee would suggest that if the more thickly settled parts of the road and station grounds were fenced with a picket or light board fence, it would greatly improve the looks and would be a better protection against trespasses and also to life and property.

A. C. STEVENS,
P. A. EATON,
GEO. NEVENS.

A general discussion followed.

W. E. CLARK (Vermont Valley) agreed that a stone wall is the best fence when available. He is disgusted with the barbed wire fence, for if a cow or horse gets scratched on the fence the owner demands pay for the injury. He thinks that a picket fence supported by wires is better.

Mr. J. S. LANE (N. Y., N. H. & H.) uses a flat ribbon wire as preferable to barbed wire.

President PATCH came to the defense of the barbed wire fence of five strands, claiming that cattle will smell it a rod off and run away. He also favored it on the ground of economy.

Mr. CLARK replied that there were cattle along his road that like to go through the barbed wire fence to scratch their backs.

Secretary ELLIS preferred either the barbed wire or the ribbon wire.

R. HYLAND (Cheshire), also favored the barbed wire fence.

Mr. CLARK said, in response to speakers who were apparently in doubt about the laws in reference to fences, that the Washburn & Moen Mfg. Co., of Worcester, published a book, containing the laws of all States on the fence question, and he thought that every roadmaster should have a copy of it.

Mr. L. J. SPAULDING (Fitchburg), said that a great deal of territory can be fenced with wire, but board fence must be used in other places, and he thought the latter the cheapest in the end.

Messrs. Hammond, Bryant, Bishop and others spoke upon the subject, after which the report of the committee was adopted, though the recommendation of barbed wire fence was somewhat dissented from.

The committee on review of previous year's questions, road tools, nut locks, foot guards, etc., reported as follows:

I think that the resolution of last year covers this subject fully in regard to road tools, foot guards, etc. In relation to nut locks, as far as my own practical experience goes with actual usage on our road, I find the Davies' spring nut lock far ahead of any device for locking the nut and keeping the bolts and angle bars firm and solid that I have ever tried, requiring very little care or attention to keep everything perfectly tight. With this exception I would consider last year's report upon this question good enough. I will send you two of the Davies' spring nut locks that have been in use on our main track for over one year, and have been tightened up but once since being on, and when taken off the whole joint was as firm as a rock.

GEO. E. DAGGETT, Chairman.

The report of the committee on Repairs of Track was published last week. A general discussion followed the reading of this report, participated in by Secretary Ellis, Messrs. Hyland, J. L. Shanks, Stevens, Collins, Bishop, Clark, Phillips, French, Mosher, J. W. Shanks, Stickney and Patch. Each speaker agreed that the committee was correct in its description of the best way to do the different portions of the work in repairing tracks, but several of them said that, owing to lack of men chiefly, they were compelled to do the work in different ways.

The report on cattle guards was discussed by Messrs. Lane, Stickney, Shanks, Clark and Patch. The general impression was that the walled ditch across the track as a cattle guard is very dangerous in case of derailment from any cause, and that as perfect a guard, and at the same time a much safer one, can be made of iron or wood slats 8 ft. long parallel with the rails and about three inches apart.

It was voted that the next annual meeting be held in Boston, beginning the third Wednesday in August, 1890.

A motion was made to amend the by laws by providing that any engineer of maintenance of way may become an honorary member by vote of a majority of members present at any meeting of the association. The motion was amended so as to admit them to full membership, and as amended was unanimously adopted.

Messrs. E. K. Post, of the New York & New England; E. H. Bryant, of the Old Colony, and A. C. Woodworth, of the New York & New England, were admitted to membership.

The committee to report on the death of L. H. Perkins, of the New York, New Haven & Hartford, submitted the following:

Resolved, That this association has, by the death of our late brother roadmaster, L. H. Perkins, lost one of its most esteemed and earnest members, one who, by his many long years of active service as a railroad man, was competent to, and did, give valuable advice and counsel in our meetings.

We do, therefore, as an association, record with more than the usual expressions of regret and sorrow the loss of our friend and brother who was so suddenly taken from us.

American Association of General Passenger and Ticket Agents.

The thirty-fourth semi-annual meeting of this Association will be held in Atlanta, Ga., at the Kimball House, Tuesday, Sept. 17, 1889, at 11 a. m.

PERSONAL.

—Mr. John S. Silver has been elected President of the Eutawville road, of South Carolina, to succeed Mr. R. C. Barkley, resigned.

Mr. John Bell, General Manager of one of London underground roads, is in New York. On Tuesday he inspected the New York elevated railroads.

—Mr. Robert McDonald has been transferred from the Intercolonial to the position of Mechanical Superintendent of the Cape Breton (government) road.

—Mr. J. H. Lawder, recently Acting General Freight Agent of the Denver, Texas & Fort Worth has been appointed General Western Agent of the Texas & Pacific, at Denver.

—Mr. Edward Moore, Foreman of Engines on the Indianapolis division of the Cincinnati, Hamilton & Dayton, died suddenly last week. He had been in the service of the company for 38 years.

—Mr. F. P. Wherry, Purchasing Agent of the St. Louis & San Francisco, having resigned to accept another position, he has been succeeded as Purchasing Agent by E. T. Smith, who will also act as Assistant to the General Manager.

—Mr. Cecil Gabbett has been chosen Vice-President and General Manager of the Atlanta & Florida road. Mr. Gabbett is also General Manager of the Atlanta & West Point, the Western of Alabama and the Cincinnati, Selma & Mobile roads.

—The office of Master of Transportation on the Toledo, St. Louis & Kansas City, has been abolished, and C. H. Pratt, who held that position, has been appointed Superintendent, retaining his duties as Purchasing Agent as before. Mr. Charles Blackwell has been appointed Assistant Superintendent.

—Mr. Horace See, for many years Chief Engineer and Naval Architect with Wm. Cramp & Sons, of Philadelphia, is to open an office in New York, as Consulting Engineer on Naval Architecture. Mr. See designed the "Vesuvius" the "Atlanta," the "Monmouth," and many other vessels built by this firm.

—Mr. C. A. Jewett, General Freight and Passenger Agent of the Kansas City, Wyandotte & Northwestern, has resigned that office, to take effect Sept. 1, and C. W. Cook has been appointed to the position made vacant by the resignation. Mr. Cook has for some time been Assistant General Freight Agent of the Milwaukee & Northern.

—Mr. William B. Strong, President of the Atchison, Topeka & Santa Fe since 1881, has resigned, to take effect Sept. 6. He will be succeeded by Mr. Allan Marvel, at present First Vice-President and General Manager of the St. Paul, Minneapolis & Manitoba. Before becoming President Mr. Strong was Vice-President and General Manager of the road from 1877 to 1881. He has been General Superintendent of the Michigan Central and of the Chicago, Burlington & Quincy.

Mr. Marvel, who succeeds Mr. Strong, is 52 years old, and entered railroad service in 1859. Since 1881 he has been connected with the St. Paul, Minneapolis & Manitoba, serving as General Superintendent, General Manager and Vice-President.

—Mr. Robert Bell, for the past 14 months superintendent of the Pittsburgh Division of the Western New York & Pennsylvania, has been appointed General Manager of the road, to succeed Mr. George S. Gatchell, recently resigned. Mr. Bell was born in England in 1844, and is a graduate of Rose Polytechnic Institute of Troy, N. Y., 1866. He has served on the Silver Lake, the Belmont & Buffalo, the New York, Lake Erie & Western, the Richmond & Danville, and other roads.

ELECTIONS AND APPOINTMENTS.

Arkansas & Gulf.—This Arkansas company has been reorganized with W. R. Bergholtz, President, and J. F. O'Shaughnessy, Treasurer.

Arkansas & Louisiana.—The receiver having been discharged, the road will be operated by the following officers: R. E. Ricker, General Superintendent; W. T. Kelly, Superintendent; M. P. Walsh, Assistant Superintendent; Julian K. Pogue, Auditor.

Atlanta & Florida.—The following are now the officers of this company: R. F. Maddox, President; Cecil Gabbett, Vice-President and General Manager; E. W. Marsh, Second Vice-President; R. J. Lowry, Treasurer; J. K. Brunner, Secretary.

Chicago, Burlington & Quincy.—A. J. Spurr has been appointed Traveling Passenger Agent, with headquarters at Clinton Block, Columbus, Ohio, vice H. O. Webb, resigned.

Columbus, Hocking Valley & Toledo.—A meeting of the directors was held last week, at which Thomas F. Ryan and Samuel D. Davidson were elected directors to fill vacancies.

Elowah Valley.—The incorporators of this Georgia company are: John Palmour, H. B. Smith, Robert McClure, W. T. Hyde, Wm. H. Burt and H. C. Johnson, of Dawson, Ga.

Fort Wayne, Wilmington & Western.—Edmund Allen, N. M. N. Stewart, Charles Smith, Michael Collins and David Willard are the incorporators of this Illinois company.

Kansas City, Wyandotte & Northwestern.—C. W. Cook has been appointed General Freight and Passenger Agent, with office in Kansas City, Mo., to succeed C. A. Jewett, resigned.

Montana Central.—C. H. Warren has been appointed Comptroller of the road at Helena, Mont.

Mobile & Eastern Shore.—C. W. Joseph, of Decatur, Ala., has been elected Secretary and Treasurer of the company.

Nashville Northern.—The following officers have been elected: Judge John Woodward, President; Isaac T. Rhea, First Vice-President; Maj. E. C. Lewis, Second Vice-President; J. M. Williams, Secretary and Treasurer, and Capt. Boynton, Chief Engineer. The latter is the Chief Engineer of the Ohio Valley.

New Haven & Derby.—The offices are to be transferred from New Haven to Bridgeport, Conn., and the offices of Secretary, Treasurer and Auditor have been discontinued. The action has been taken owing to the lease of the road to the Housatonic.

Northern & Northwestern.—The offices of the superintendent and engineer are to be removed from Toronto to Ashlandale, Ont.

Oregon Short Line & Utah Northern.—The Oregon Short Line, the Utah & Northern, the Utah Central, the Salt Lake & Western, the Utah & Nevada, the Ogden & Syracuse, the Idaho Central and the Nevada Pacific having been consolidated and having become the Oregon Short Line & Utah Northern Railway Co., the following notice is issued:

G. M. Cumming has been appointed General Manager, with office at Salt Lake City, Utah, and will report to the Vice-President at Omaha. He will continue to act as Assistant General Manager of the Wyoming Division of the Union Pacific until further orders, and as such will report to the General Manager of that company.

C. J. Smith, with office at Portland, Oregon, will continue to be General Manager of the lines of the Oregon Railway & Navigation Co., which are leased to this company as the

successor of the Oregon Short Line. He will report to the Vice-President at Omaha.

The lines of this company south of Ogden have been designated the Utah Division and W. W. Riter has been appointed Superintendent of the Division, with office at Salt Lake City.

Erastus Young has been appointed Auditor, with office at Omaha, Neb.

Perry, Pittsfield & Southern.—The incorporators and first board of directors of this Illinois road are: Clark P. Chapman, Eden M. Seely, Edward F. Binns and George Barber, of Pittsfield, Ill., and Asbel Hinman and George W. Witham, of Perry, Ill.

St. Louis & San Francisco.—E. T. Smith has been appointed Purchasing Agent vice F. P. Wherry, resigned. Mr. Smith will also act as Assistant to the General Manager.

St. Louis & West Plains.—E. C. Simmons, Hamilton Daughday, S. B. Sale and A. H. Clark, of St. Louis, and others have organized this new Missouri road.

St. Paul, Minneapolis & Manitoba.—R. W. Bryvan has been appointed Superintendent of the Breckenridge Division at Minneapolis, Minn., to succeed H. C. Ives, promoted to be General Manager of the Montana Central.

San Antonio & Aransas Pass.—At a meeting of the directors, Aug. 19, C. S. Schreyer was elected Treasurer, vice A. Hansl, resigned. H. Michaelson, who has been Acting Treasurer, will probably resume his duties as Commercial Agent at San Antonio.

Staunton & West Augusta.—E. C. Vincent has been appointed Chief Engineer, with office at Staunton, Va.

Texas & Pacific.—J. H. Lawder has been appointed General Western Agent of the company, with headquarters in Denver, Colo., vice Wallace Wood, Traveling Freight and Passenger Agent, resigned. He will have charge of the territory north of the Texas line and west of the Missouri River.

Toledo, St. Louis & Kansas City.—The office of Master of Transportation has been abolished. C. N. Pratt has been appointed Superintendent and Purchasing Agent, with headquarters at Frankfort, Ind. Charles Blackwell has been appointed Assistant Superintendent, with office at Frankfort. Mr. Blackwell will have general supervision of the mechanical department and train service. E. J. Linchey, in addition to his duties as Commercial Agent at St. Louis, has been appointed General Agent at East St. Louis.

OLD AND NEW ROADS.

Atlanta & Florida.—The directors have voted to issue \$600,000 of 6 per cent. bonds to pay the present indebtedness. The bonds will be issued at the rate of less than \$6,000 per mile, and it is claimed that they can be placed at par.

Beech Creek.—A survey is said to be in progress from Gazzam, Pa., the terminus of the road northwest to Oil City, Pa., where connection can be made with the Lake Shore & Michigan Southern.

Belleville, Centralia & Eastern.—The city council of Belleville, Ill., has granted the road right of way through the city to the station of the Illinois & St. Louis road, over which it will run to St. Louis, both lines being part of the Louisville, Evansville & St. Louis consolidated road. Grading will soon commence at Belleville, and be continued easterly to meet the forces grading from Mount Vernon.

Birmingham Mineral.—J. W. Worthington & Co., of Birmingham, have completed the grading and masonry on the Red Gap extension from Gate City through Red Gap to Graces, Ala., 10 miles.

A branch was built last year from Boyle's to Oneonta, Ala., and the company is said to now have a surveying party in the field surveying from Oneonta to Huntsville, Ala., about 60 miles.

Burlington & Missouri River.—Track has been laid from Alliance, Neb., northwest to Crawford, on the Fremont, Elkhorn & Missouri Valley road. Work is still in progress and the track will soon be laid across the state line into Wyoming and toward the coal fields in that state. Kilpatrick Bros. & Collins, of Beatrice, Neb., are the contractors. Mr. H. C. Nutt, Jr., is in charge of the engineering work.

The Colorado Division of this road, formerly the Denver, Utah & Pacific, will be made standard gauge from Denver to Longmont, Col., 33 miles, by Sept. 1, on which day it is expected that the new trains will begin running.

Central of New Jersey.—It is expected that the construction of the road to Stroudsburg, Monroe County, Pa., and perhaps north up the Delaware River Valley to Port Jervis, N. Y., will soon be resumed. The proposed road has been graded from Salersburg to within four miles of Stroudsburg, and it is intended run through Wind Gap, ten miles west of Delaware Water Gap, shortening the distance between Philadelphia and Stroudsburg by 23 miles.

Central of New Jersey.—In our account of the South Easton & Phillipsburg road last week, on page 562, it should have been stated that the proposed bridge was to be built from Easton, Pa., to Phillipsburg, N. J., instead of to Belvidere, N. J.

Charleston, Cincinnati & Chicago.—Geo. W. Callahan, R. F. Rivenac, Wm. Stallings, T. H. Stansill and W. J. Colvin have been awarded sub-contracts on the line between Johnson City, Tenn., and Minneapolis, Va., by McDonald, Shea & Co., and they will at once put large forces on the work.

Chesapeake & Ohio.—Work is still in progress on the five-mile branch from Paint Creek, W. Va., of which J. C. Carpenter is the contractor; and also on the branch from River View across New River to the coal fields on the opposite side. Eleven miles of double track between Cannelton and River View, W. Va., is also being built.

Cheyenne & Northern.—Fitzgerald Bros. & Co., of Lincoln, Neb., are said to have the contract for extending this road from Wendover north to Douglas, Wyo.

Chicago, Kansas & Nebraska.—The Metropolitan Trust Co., of New York, has brought suit against the Chicago, Rock Island & Pacific, as lessee of the Chicago, Kansas & Nebraska, asking for the foreclosure of a mortgage of \$25,000,000, given by this company to secure money for the construction and equipment of the line. Interest on the bonds due Jan. 1 and July 1, 1889, amounting to \$1,200,000, remains unpaid.

Chicago, St. Paul & Kansas City.—Engineers, said to be employed by this company, have just completed a survey from Savannah, Andrew County, Mo., on this com-

pany's line, a few miles north of St. Joseph, northwest to Rockport, Atchison County, a distance of about 45 miles. The officers are examining the engineers' notes, and will soon decide whether to build the road or not.

Cleveland, St. Louis & Kansas City.—Suits have been filed in the Circuit Court of St. Charles County, at St. Charles, Mo., to enforce liens of contractors against the company for amounts aggregating over \$100,000. Bethune, Shafer & Co. hold the largest claim, their liens aggregating over \$92,000.

Columbus, Lima & Milwaukee.—A large force is now at work on this road near Defiance, O., grading from that point to Lima, O., to which point it is claimed the road will be completed by Jan. 1. J. R. Richards & Co. have been awarded a contract on the road.

Concord.—Caldwell & Varnum, of St. Johnsbury, Vt., are doing the tracklaying and ballasting on the Lake Shore road from Lake Village to Alton Bay, N. H., 17 miles. All the grading has been finished and the track is being laid. The grading is nearly done on the Suncook Valley extension road and tracklaying has been commenced. This road will extend from Pittsfield to Barnstead, N. H., 4½ miles. The Tilton & Belmont is now operated by this company between Tilton and Belmont, H. H., 4 miles. All these lines are built by independent corporations, but are to be leased and operated by the Concord. Frank A. Merrill, of Concord, N. H., is Chief Engineer.

Cooperstown & Charlotte Valley.—A survey is soon to be made for an extension of this road southeast to Saugerties or Catskill Village, to give an all-rail line from the Catskill Mountains to Richfield Springs, N. Y.

Denver & Rio Grande.—A contract was let by the company last week to Linley Brothers, of Denver, to construct the rack railroad from Manitou, Col., to the summit of Pike's Peak.

Detroit, Charlevoix & Escanaba.—Work has just been commenced on this road by Thomas Rock, of Chicago, who has the contract from Petoskey City to Charlevoix, Mich., and it is expected that this section will be completed in October. The road is projected to extend from Mackinaw City to Harrison and St. John's, Mich. R. M. Cherrie is President, and S. H. Beardslee is Chief Engineer at Charlevoix.

Duluth, Crookston & Northern.—George H. Walsh has the contract for grading this road from Fertile to Crookston, Minn., 23 miles.

Ellensburg & Northeastern.—The contract was let last week for the grading of the first 10 miles of the track between Ellensburg, W. T., and the Columbia River.

Etowah Valley.—The company has filed an amended charter in Georgia to build a road from Dawsonville to Leathersford, about 12 miles. The capital stock is \$25,000.

Fort Wayne, Wilmington & Western.—Articles of incorporation have been filed in Illinois for the Fort Wayne, Wilmington & Western, to be constructed in Will County, Ill., running west through Washington, Plotone and Wilmington to Blodgett station, on the Chicago, Santa Fe & California. The principal offices of the new company will be at Wilmington. The capital stock is placed at \$2,000,000.

Fort Worth & Rio Grande.—Grading is in progress between Stephenville and Dublin, Tex., from both points, and tracklaying is expected to be finished to Dublin by Oct. 15.

Geneva & Sayre.—A company by this name has been incorporated to operate the Geneva, Ithaca & Sayre, which was sold at foreclosure sale Aug. 27. The capital of the new company is placed at \$1,200,000, and George M. Diven, of Elmira, and William Stevens, of Sayre, are the principal stockholders.

Grand Rapids & Indiana.—A survey is in progress for a proposed extension of the Missaukee branch east about five miles to Lake City, Mich.

Hunts Central.—The preliminary survey on this Nova Scotia road has been completed from Truro west, about 10 miles, to Maitland, and is now in progress toward Windsor, 40 miles further, under Chief Engineer Dickey. It is claimed that the location will be completed early in October, and the plans ready for the inspection of both the Dominion and Provincial governments. B. C. Mudge, of Boston, is one of the projectors.

Hartford & Connecticut Western.—The Railroad Commissioners of Connecticut have rendered a decision approving the location of the branch to Springfield, Mass., in the towns of Simsbury, East Granby and Suffield. The extension will start from the main line, in Simsbury, 2,000 ft. east of the bridge over the Farmington River, where the disaster occurred a few years ago, and extend through the towns of East Granby and Suffield to the Massachusetts line. The new line will extend through Vineyard Gap and along the West Suffield Valley. The surveys contemplate under-grade crossings at Tariffville and East Granby, and over-grade crossings at Spoonville, at the highway between East Granby and West Suffield, and along the highway through the latter place.

Illinois Elevated.—Articles of incorporation have been filed in Illinois of the Illinois Elevated Railway Co., of Chicago. It is proposed to construct railroads from Chicago, northerly, westerly, southerly and southwesterly to the limits of Cook County, with various branches. The capital stock is \$10,000,000. The incorporators and first board of directors are: Michael W. Ryan, John Tyler, Edward C. Donnohan, William W. Bell and Paul Brown, all of Chicago.

Indiana & Lake Michigan.—The following contracts have been let for work on this road, beginning at St. Joseph, Mich.: Joseph Donagoe, of St. Paul, Minn., south 10 miles; H. Green, the next 12 miles, to Galien, and C. C. King & Bros., from Galien south 6 miles. As soon as the right of way is secured to South Bend, Mich., 12 miles further, the contract for that section will be let.

Ithaca, Auburn & Western.—The road was sold at Ithaca, N. Y., Aug. 23, upon a foreclosure of the first mortgage, whose bonds amount to \$400,000. There is an issue of second mortgage bonds amounting to \$498,000, and \$975,800 of common stock. These latter are wiped out by the sale. The Lehigh Valley road held \$95,000, and was represented in the bidding. The road was sold to E. M. Barnes and others, of New York City, for \$167,000. It is the announced intention of the new owners to build an extension of the road to Ithaca.

Kinderhook & Hudson.—George Clarke, of New York, and John Cameron, of Plainfield, N. J., have the contract for the grading and masonry work on this line from Hudson northerly to Kinderhook Station, N. Y., on the Boston & Albany, about 18 miles. The tracklaying will be done

by Moffett, Hodgkins & Clarke, of Watertown, N. Y. E. G. Ferriss, of Hudson, N. Y., is Chief Engineer.

Knoxville Extension, Dahlonega & Augusta.—A bill to incorporate this road has been introduced in the Georgia Legislature. It is to build from Blue Ridge, on the Marietta & North Georgia, to Dahlonega, and thence to Gainesville and Augusta, the road to connect at Blue Ridge with the Knoxville Southern. The capital is to be \$500,000.

Lake Shore & Michigan Southern.—The report for the second quarter shows: Gross earnings, \$4,606,877; operating expenses, \$2,983,337; net earnings, \$1,623,479; other income, \$101,120; gross income, 1,724,600; fixed charges, \$1,047,744; net income, \$667,855; cash on hand, \$2,888,366; profit and loss, surplus, \$10,571,785.

Little Falls, Van Hornesville & Otsego Lake.—This company is securing right of way and soliciting subscriptions to its capital stock from the towns along the route. The road is to extend from Little Falls, N. Y., south to Van Hornesville, about 17½ miles. The grade for the first three miles from Little Falls will be about 105 ft. to the mile, and about 80 ft. for the next few miles. It is estimated that it will cost \$18,000 per mile to build the road. L. E. Babcock, of Little Falls, is Chief Engineer.

Los Angeles, San Diego & Yuma.—It is stated that an issue of \$5,000,000 bonds has been placed in New York, and that contracts have been let for building the first 40 miles. Thirty miles of this road are built, and these new contracts are for building the road from National City, 30 miles from San Diego eastward. The line runs from San Diego to Cuyamaca, Cal., and thence across the Colorado desert to Yuma. It gives the Southern Pacific direct entrance to San Diego County. The following are interested in the road: Wm. E. Graves, Alfred Sully, L. R. Bacon and W. N. Sanford, all of New York, and William H. Carlson, of San Diego.

Louisville Southern.—The extension from Lawrenceburg, Ky., to Lexington, Ky., 22 miles, was opened for operation on Saturday, Aug. 24, in time to obtain the \$100,000 subsidy voted by Lexington.

Macon & Birmingham.—The contract for building the road from Macon, Ga., west to Thomaston, Ga., about 50 miles, has been let, and work will soon commence. The locating survey is being completed rapidly.

McKeesport & Duquesne.—Incorporated in Pennsylvania to build from McKeesport south along the Monongahela River for two miles. Among the incorporators are: J. C. Smith, E. F. Wood and A. S. Weddell, of McKeesport.

Mexican Central.—Construction on the Tampico division is going actively forward. The road-bed is ready for the rails as far as Puerto de San José, east of San Luis Potosí, and the track has been laid beyond Soledad.

Mexican National Construction Co.—The company will open for traffic early next month the mine from Manzanilla to Climax. The line from Armeria to Colima was exceedingly heavy, and work was not commenced until January last. Stephen Heaton is the contractor. The bridge over the Armeria River, 650 ft. long, is nearing completion. Work is in progress from Colima north toward Guadalajara. The section from Zacatecas to Ojo Caliente, on the line to Montezuma, will soon be opened. F. A. Greene is Engineer-in-Charge, and James Wilson is Superintendent of Construction of the Colima Branch.

Milwaukee, Bay View & Chicago.—Articles of incorporation have been filed in Wisconsin by a company with this name, with \$100,000 capital stock, to build a road from Milwaukee to Chicago. It is reported that the line is projected in the interests of the Wisconsin Central.

Monongahela River.—The iron bridge over the Monongahela River three miles above Fairmount, W. Va., has been completed, and track has been laid for nearly six miles from Fairmount to the new town of Camden, where large coke ovens have been built. The road is to extend from Fairmount, on the Wheeling Branch of the Baltimore & Ohio, southwest to Clarksburg, on the Parkersburg Branch of the same road, about 35 miles.

New Roads.—The survey has been completed for the proposed line from Binghamton, N. Y., to Montrose, Pa., and the engineers have submitted their report to the Binghamton Board of Trade. It shows that the heaviest grade in the route of 30 miles is less than 125 ft. to the mile, and that the widest stream to be bridged is about 100 ft. Only one stream of more than 25 ft. must be bridged, and there are few cuts. The route proposed touches Silver Lake, Forest Lake, Quaker Lake, Brackneyville and other towns. It comes into Binghamton at Rossville.

It is announced that a road will be built from Santa Anna, Cal., the county seat of Orange County, lately formed from a part of Los Angeles County, to a point on the coast, about ten miles distant, from which direct ocean communication can be had to San Francisco. A wharf has been constructed, and part of the grading completed.

New York, Lake Erie & Western.—The following table shows the gross and net earnings of the road for the month of July and the 10 months to July 31. Both the gross and net earnings for July were the largest in the history of the company for that month:

Month of July:	1889.	1888.	Inc.
Gross earnings	\$2,538,440	\$2,378,769	\$159,671
Oper. expenses	1,636,514	1,539,320	117,194
	\$81,926	\$39,449	42,477
Less proportion due leased lines	218,872	208,825	10,047
Net earnings	\$663,054	\$630,624	\$32,430
Ten months to July 31:	1889.	1888.	Dec.
Gross earnings	\$21,699,438	\$22,398,433	\$698,995
Working expenses	14,187,933	14,691,173	413,240
	\$7,511,505	\$7,707,260	\$285,755
Deduct proportions due to leased lines, which are worked on a percentage of earnings	\$1,928,712	\$1,965,075	\$36,363
Net earnings	\$5,582,793	\$5,742,185	\$247,392

Northern Pacific.—On the new line from Gallatin to Butte, Mont., 70 miles, over 15 miles of track have been laid, and about a mile a day is now being laid. On the line from Little Falls to Stables Mill, Minn., 33 miles, over 10 miles of track has been laid. Tracklaying will commence immediately on the extension of the Central Washington from Davenport to Almira, Wash. Ter.

Pennsylvania.—The statement of the business of all lines east of Pittsburgh and Erie for July, 1889, as compared with the same month in 1888, shows an increase of gross earnings of \$419,292; an increase of expenses of \$162,016; an increase in net earnings of \$257,246. The seven months

of 1889, as compared with the same period of 1888, shows an increase of gross earnings of \$565,294; an increase in expenses of \$500,340; a decrease in net earnings of \$25,046. All lines west of Pittsburgh and Erie for the seven months of 1889 show a deficiency in meeting all liabilities of \$157,885, being a gain, as compared with the same period of 1888, of \$39,605.

Pennsylvania, Poughkeepsie & Boston.—The company expects to have trains running from Slatington, Pa., to Campbell Hall, N. Y., a distance of 90 miles, some time in September. Trains are now running on part of the road in Northampton County, the long bridge at Portland, Pa., is nearing completion, and work is being pushed on the bridge over the Lehigh River at Slatington.

Perry, Pittsfield & Southern.—Incorporated in Illinois to build or acquire a road from Perry to Pittsfield, thence to a point on the Mississippi River opposite the city of Louisiana, with a branch line from Pittsfield to Nebo, all in Pike County, with the principal office in Pittsfield. The capital stock is \$500,000.

Philadelphia & Reading.—The following is the statement of the operation of the road for July, 1889, compared with the same month of 1888: Gross receipts, July, 1889, \$1,804,311; 1888, \$1,745,552; increase, \$60,758. Gross expenses, excluding rent and interest, July, 1889, \$902,984; 1888, \$880,989; increase, \$21,994. Profit in operating, July, 1889, \$901,326; 1888, \$862,563; increase, \$38,763. Profit from Dec. 1 to date, \$4,563,368; same period last year, \$5,158,664; decrease, \$595,296.

Puebla Industrial.—The Mexican Department of Public Works has entered into a contract with Ramon Miranda y Marron for the construction of a standard gauge road, without subvention in the states of Puebla and Tlaxcala; to begin in the city of Puebla between the stations of the Mexican and Inter-oceanic roads and terminate at El Valor factory; a branch will extend to the Santa Cruz factory. Permission is given to extend this branch to the city of Cholula. Construction is to begin in six months and the line is to be completed in three years. Passenger rates are fixed at 3 cents per kilometre for first-class, 2 cents for second-class, and 1½ cents for third-class. Merchandise rates are, per ton per kilometre: 6 cents for first-class, 4 cents for second-class and 3 cents for third-class.

Richmond, Nicholasville, Irvine & Beattyville.—The entire contract for grading, masonry and trestling on divisions two and three, 57 miles, extending from Richmond, in Madison County, southeast to Beattyville, in Lee County, Ky., was awarded last week to D. Shanahan & Co., of Louisville, who also have the contract from Nicholasville to Richmond, 22 miles. The first division, from Versailles to Nicholasville, 16 miles, is the only one not under contract, and it is not expected that work will be begun on it for some time. Shanahan & Co. will probably let out much of the work to sub-contractors. The Richmond and Nicholasville division is fast nearing completion, and as forces finish they will be transferred to the second and third divisions. The cost of construction is estimated at \$355,000, and the track is to be finished to Irvine, in Estli County, by April 1, 1890, and to Beattyville, in Lee County, the terminus of the road, in June, 1890.

Rockaway Valley.—Two miles more of the extension from New Germantown to Pottersville, N. J., has been opened for traffic. The next two miles to Pottersville is nearly all graded, and tracklaying will soon begin. The largest bridge on the extension, that over the Lamington River, is nearly completed. The road was built to carry peaches and other small fruit grown along the route and is more than meeting expectations. It is now earning \$100 a day and has developed a good local traffic.

Seattle & Northern.—The recent stoppage of work on this road has thrown 1,000 men out of work. The road had been graded and bridged from Anacortes, 25 miles up the Skagit River to Sterling, Wash. Ter., when it was abandoned.

St. Louis, Arkansas & Texas.—The Master in Chancery has filed reports approving the application of the Receivers to issue \$189,000 debenture bonds to pay audited claims, and also the application to issue debenture bonds to an amount not exceeding \$350,000 to replace 113 miles of road with heavier steel rails.

St. Louis & Chicago.—The agreement of the bondholders for the reorganization provides for the issue of \$600,000 first mortgage 5 per cent. bonds, to take up \$500,000 old first mortgage bonds, pay off coupons, etc. The capital stock will consist of \$1,300,000 preferred and \$1,500,000 common stock. The present consolidated bonds will be given par in both common and preferred stock, and the balance of the stock will be devoted to the purchases of the new company.

St. Louis & Peoria.—It is expected to have this road, which is an extension of the St. Louis & Chicago, completed by Sept. 10. It is to extend from Mount Olive to Alhambra, Ill., 14 miles, about eight miles being already completed. C. Forduskey, of St. Louis, is the contractor.

St. Louis & West Plains.—This company is to be organized to build the proposed road between Salem and West Plains, Mo., about 75 miles, which will give the latter town a connection at Salem with the St. Louis & San Francisco, which line will probably operate the road when it is built.

San Antonio & Aransas Pass.—The city council of Waco, Tex., recently granted this company the right to build the extension from West Point through certain streets in the town to reach its proposed station. The company has been prevented from doing this, as part of the right of way is claimed by the St. Louis, Arkansas & Texas, which has a track across it and which refuses to allow this company to interfere with it.

South Brunswick Terminal.—Tracklaying has been commenced at Waynesville, Ga., and is now in progress and will probably be completed by Sept. 15. The road will be 16 miles long from South Brunswick to Waynesville, Ga., and about 10 miles of the grading is now done.

Toledo, Saginaw & Mackinac.—The company has made an arrangement with the Saginaw Construction Co. by which the line will be operated by the Toledo, Ann Arbor & North Michigan when the extension to Oatka is completed. The Saginaw Construction Co. built this road from Durand to East Saginaw, 39 miles, and is extending it 20 miles north of East Saginaw to Oatka Beach.

A survey is being made northwest from West Bay City, along the shore of Saginaw Bay, toward Au Sable, Mich.

Turtle River.—This company proposes to build a road from Brunswick, Ga., to the new docks of the East Tennessee, Virginia & Georgia, about five miles from Brunswick.

Union Pacific.—The gross earnings of the whole system for July were \$2,716,577, an increase over the same month last year of \$172,514. The net earnings were \$1,300,294, an increase of \$270,298. For seven months, to July 31, the

gross earnings were \$15,495,265, a decrease of \$542,378. The net earnings were \$6,070,325, an increase of \$72,944. The expenses show a decrease of \$37,784 for July and \$615,300 for the seven months.

Tracklaying on the "Carbon Cut-off Railroad," a branch of the Union Pacific in Wyoming, will begin about Sept. 5. The line will be 18 miles long when completed.

Victoria, Saanich & New Westminster.—At a meeting of the City Council of Victoria, B. C., a by-law, granting this company a bonus of interest at the rate of four per cent. per annum on an issue of \$100,000 bonds for 25 years, and an exemption from all municipal taxation for ten years, was carried by a majority of only three. At the same time a by-law was voted upon authorizing the city to subscribe for \$125,000 of the capital of the company, but was defeated by a majority of 48 votes. The company is chartered to build from Victoria to a point at or near Swartz Bay, North Saanich, Vancouver Island, with a branch line to Esquimalt, then on the main land of British Columbia from Point Roberts, north of the United States boundary line, thence to New Westminster to connect there with the Canadian Pacific, with power also to extend their line to Blaine, Wash. Ter. The capital stock of the company is \$2,500,000. There is considerable local opposition to the construction of this line, and the present outlook for the promoters is not by any means favorable.

Waukegan & Southwestern.—E. P. Reynolds & Co. are the contractors for this road, which is being built from Spaulding to Waukegan, Ill., on Lake Michigan, a distance of 36 miles. Some track has already been laid. The road is an extension of the Elgin, Joliet & Eastern. S. B. Jackson, Royal Insurance Building, Chicago, is Chief Engineer.

Waverly & New York Bay.—B. M. & J. F. Shanley, of Newark, N. J., are the contractors on this line, which is to be built by the Pennsylvania from Waverly to a point on New York Bay, to give it a freight line around Newark, N. J.

Waverly Northern.—This company has been organized at Waverly, Ia., to build northerly to the state line, and also southerly through Waterloo to Cedar Rapids. The projectors expect one of the larger companies will operate the road when finished.

Weatherford, Mineral Wells & Northwestern.—A mortgage for \$350,000, bearing six per cent. interest, has been filed in this county by the road in favor of the Manhattan Trust Co., of New York. The mortgage is to secure the bonds of the road.

Western & Atlantic.—The Georgia House of Representatives has passed the bill for the disposition of this road, after a hard fight on the question of excluding railroad companies from the privilege of bidding. The bill, however, leaves the field open for all, and it is expected that the Louisville & Nashville, the Cincinnati, New Orleans & Texas Pacific, and the Richmond & Danville will be the principal bidders for the proposed lease.

Western Maryland.—It is announced that work will soon commence on the proposed line of the Baltimore & Harrisburg, from Porter's northeast to York, Pa., a distance of about 14 miles.

West Virginia Central.—Work is reported to have been commenced on an extension from Bayard, southeast to Moorefield, W. Va., about 50 miles distant.

Weston & Elk River.—The contract was let Aug. 21 for building the road ready for tracklaying by April 1, 1890. It is to extend from Weston southwest 42 miles to Braxton C. H., W. Va.

Wheeling & Lake Erie.—The city of Steubenville, O., has been enjoined by the Common Pleas Court at Columbus, O., from condemning property for the right of way through the city for this company's proposed extension from Bowers-town, east.

Windsor & Annapolis.—Grading is well advanced on the line which the Dominion Government is building from Digby to Annapolis, N. S., 20 miles, which will connect the Western Counties and Windsor & Annapolis roads. The contractors are at work upon the piers and abutments of the bridges over Bear, Moose and Joggins Rivers.

Zacualtipan.—The Mexican government has granted a concession to Richard Money, an Englishman, for the construction of the Zacualtipan Railroad. It is proposed to construct a line from Pachuca to Tampico, passing through the rich manufacturing districts of Apulco and Zacualtipan, with the right to build branches to connect Tulancingo, Trilindad, Los Reyes, Encarnacion and Guadalupe iron works with the main line. The concessionaire receives on the whole main line a subsidy of \$9,000 per mile.

TRAFFIC.

Traffic Notes.

The reduced rates on iron articles announced by the Central Traffic Association will not go into effect until Sept. 16. Steamships from Chinese ports via the Suez Canal are making extremely low rates on tea, and the Southern and Union Pacific roads ask the Eastern lines to join them in a reduction of the rate from San Francisco to the Atlantic seaboard to 75 cents per 100 lbs., the present rate being \$1.

Simpson & Watkins, anthracite coal operators in the Carbonate district of Pennsylvania, have filed with the Interstate Commerce Commission a complaint against the New York, Lake Erie & Western charging unjust discrimination against the complainants in freight rates and shipping facilities.

Scalpers at Chicago are doing a rushing business with Grand Army encampment tickets, selling large numbers at \$1.50 for the round trip to Milwaukee, and the price will probably go lower. It is said that everybody going to Chicago now travels on a G. A. R. ticket, the unused portion (Chicago to Milwaukee and return) being sold for what it will bring.

The Railroad Commissioners of Missouri have, in accordance with a law passed by the last legislature, appointed State grain inspectors at St. Louis, Kansas City and St. Joseph. The newspaper reports indicate that political workers and others, clamoring for appointment as assistant inspectors, made things lively in the respective cities for a number of days.

On Aug. 21 the Chicago & Alton sent official notice to Chairman Mideley, of the Western Traffic Association, that when through rates are given and published from points west of the Missouri River to Chicago, the Alton will protect such through rates, even if the property is billed locally and at local rates to the Missouri River. The notice avers that this position is taken because the Chicago, Milwaukee & St. Paul, the Chicago, St. Paul & Kansas City, and the Missouri Pacific have adopted the same rule.

Northwestern Rates.

At the meeting of the Western Freight Association in Chicago, Aug. 23, to consider the 15-cent rates which had been put into effect between Chicago and St. Paul by the Chicago, Burlington & Northern and others, no agreement was reached, and Chairman Faithorn was sent to consult with Chairman Cooley, of the Inter-state Commerce Commission, who was then in Chicago. Mr. Faithorn returned with the following memorandum, which is published as "Chairman Cooley's opinion:"

First—The tariff which the Chicago, Burlington & Northern has put into force is nothing but a local tariff. It is not a joint tariff, and nothing can be a joint tariff in which the lines do not unite. Therefore, every time the charge on a local consignment is different from the rates named in said tariff, it is a breach of the law, each consignment being a separate offense.

Secondly—Even if the rates were otherwise legal, the great disparity between them and the so-called local rates would, of itself, render them illegal; and this applies whether the fourth section is ignored or not.

Thirdly—If it is persisted in, the remedy will be for the Commission to reduce the local rates to the basis which has been established. The roads must expect that that remedy will be applied, and that speedily.

Note—If the Commission announces rates, these rates hold good until changed by them.

Fourthly—The Commission prefers that the roads deal with this question themselves, but cannot tolerate the present condition of things, and prompt action must be had. It is a public scandal and disgrace, and will, if it is continued, reflect upon the Commission, as the action taken is invalid. No ten days' notice is necessary.

The Chicago, St. Paul & Kansas City at once reduced its local rates from Chicago to St. Paul to the basis of 15 cents, first-class, and made its other rates correspondingly low, so as to conform strictly to the fourth section of the Interstate Commerce law. The reporters called on Chairman Cooley in the evening, and report him as saying: "The officials of the Northwestern roads are acting like a parcel of fools. Of course, Canadian Pacific competition has eaten deeply into their earnings, but that is no reason why illegal tariffs should be made to meet the situation. I appreciate the condition of the roads fully, and will help them all I can, but I certainly will not allow them to proceed further in their present lawless course. The roads were making a laughing stock of the Inter-state Commerce Commission. We propose now to see that the law shall be obeyed. The Inter-state Commerce Act is not perfect, and we already see where it can be improved. It will probably be amended during the next session of Congress with a view to protecting American roads from Canadian competition."

On the next day, Friday, the meeting of traffic men passed a resolution cancelling all the low proportional tariffs that have been issued, and directing the chairman to confer at once with Eastern lines, with a view to the publication of through rates at Eastern points by which the intent of the lines to make rates that would meet those of the Soo Line should be accomplished without violating the provisions of the law referred to in Chairman Cooley's memorandum.

The Canadian Pacific's Position.

President Van Horne, of the Canadian Pacific, in an interview published at Chicago, says: "Judge Cooley has apparently formed his opinion without giving the defendant an opportunity to be heard. The Canadian Pacific is not, and never has been, an eager competitor for freight traffic between the Eastern and the Pacific coast states. It has arbitrary rates to pay to its connections at both ends of the line on such traffic, and these arbitrary rates leave too little profit to make the traffic worth fighting for. There is little, if any, sincerity in the complaints of the other Pacific lines about the effect of its competition. The Canadian Pacific was used by them as a bugbear in their attempt to prevent the passage of the Inter-state Commerce act, and its use as a bugbear has been continued for the purpose of obtaining modifications of the act. They are disappointed at finding the Canadian Pacific living up to its terms more faithfully than they did themselves. I feel sure that Judge Cooley will do us the justice to say that it has done so. I do not hesitate to say that at the bottom of this fuss about the Canadian Pacific's competition and Canadian railroads generally have been the American Pacific lines, and chiefly the Southern Pacific, some of the Eastern trunk lines joining it in a half-ashamed way."

Water Transportation of Lumber.

Under this title the *Northwestern Lumberman* in a recent editorial says that the question of transporting lumber over long distances chiefly by water is now attracting considerable attention. The article says, in substance: the extensive penetration by railroads of virgin forests in Michigan, Wisconsin and Southern States has led to the shipping of much lumber by rail. Railroad transportation is prompt, certain and avoids considerable transferring. Lumber transportation on Southern rivers has fallen off of late years, though there is still considerable lumber carried on the Mississippi, Tennessee, Cumberland and Ohio rivers to St. Louis. The many rivers that enter the Lower Mississippi and the Gulf afford numerous channels for lumber transportation. There has lately been some movement in shipping lumber northward from lower Mississippi River points, the rate being about 16 cents per 100 lbs. by regular steamers to St. Louis. This is one-fourth less than rail rates, and barge lines carry at a still lower rate. Northern manufacturers are likely to develop this means of transportation. It is proposed to improve the channel of the Missouri and transport lumber between St. Louis and Kansas City, and also possibly to take lumber as far up the Missouri as Bismarck in seasons of high water. More lumber is arriving at St. Louis from Arkansas by river this season than heretofore. There is a scheme on foot to bring lumber from cypress lands in South Carolina to interior New York and Pennsylvania points, by vessel and canal.

Commodity Rates to Missouri River Points.

Chairman A. F. Walker, of the Inter-state Commerce Railway Association, refuses the application of the Chicago, St. Paul & Kansas City for authority to apply to St. Joseph, Mo., the low commodity rates which have been in force from Chicago to St. Paul for several weeks. That road put those rates in effect to Marshalltown, Ia., because that town enjoyed them from Peoria by the Iowa Central, and the Iowa Central in turn had made them to Marshalltown because it made them to St. Paul to meet Canadian and water competition. The C., St. P. & K. C. desired to make rates to Des Moines on the same basis as to Marshalltown and to St. Joseph on the same basis as to Des Moines, for the reason that it was not right to discriminate so widely between different divisions of the same road. But Chairman Walker quotes the opinion of Chairman Cooley in the C., St. P. & K. C. case (2 I. C. R., 231), and also the decision in *Business Men's Ass'n of Minn. vs. C. & N. W.* (2 I. C. R., 73), and of Logan and others vs. C. & N. W. (2 I. C. R., 604), to the effect that low war rates on one portion of a road do not establish a standard for use on other portions. The rightful influence of St. Paul rates on St. Joseph rates may or may not be great, but so long as the present St. Paul rates are admittedly on a war basis they should not be taken as a basis in the Southwest without greater provocation than now exists.